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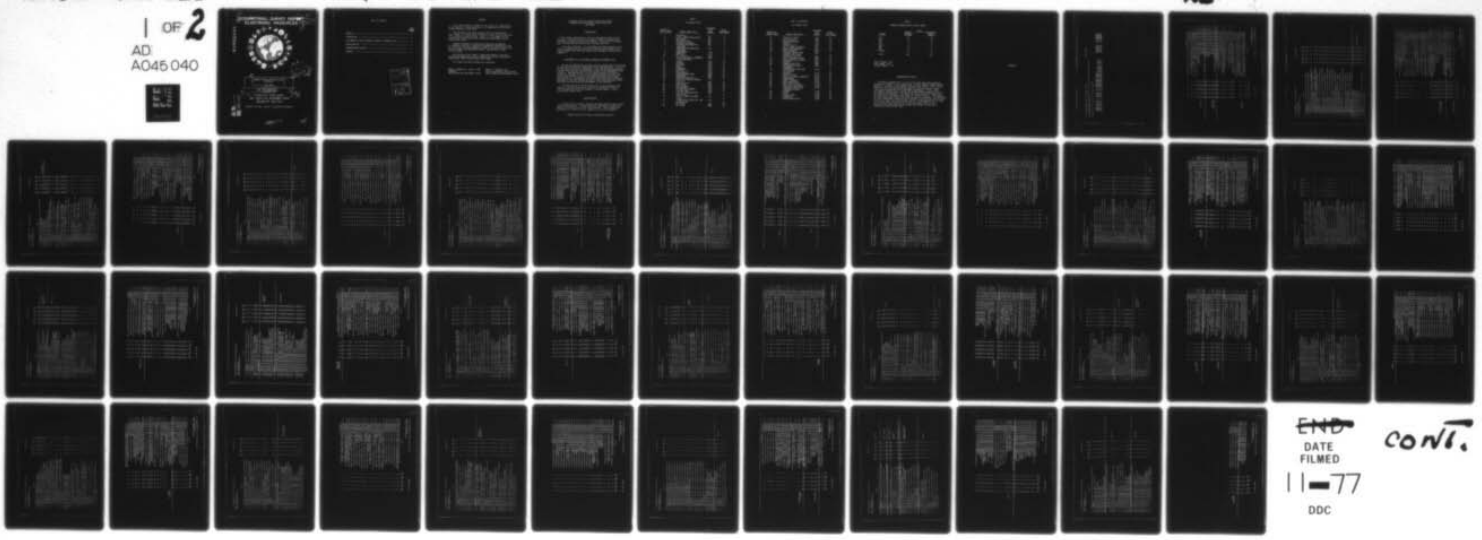

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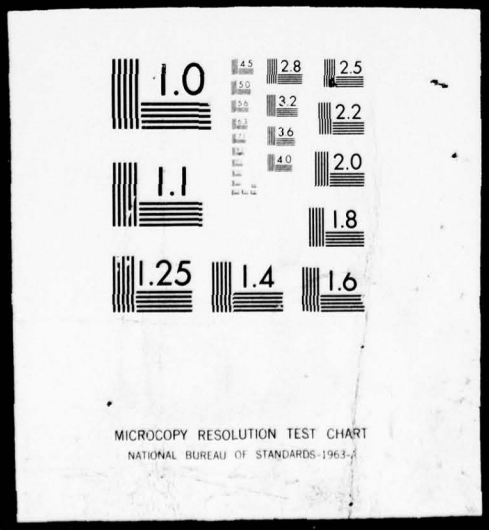

OCCUPATIONAL SURVEY REPORT
ELECTRONIC PRINCIPLES

COMMUNICATIONS ELECTRONICS SYSTEMS SPECIALIST

AFSC 30455

AFPT-90-304-222
2 September 1977

OCCUPATIONAL SURVEY BRANCH
USAF OCCUPATIONAL MEASUREMENT CENTER
LACKLAND AFB TEXAS 78236

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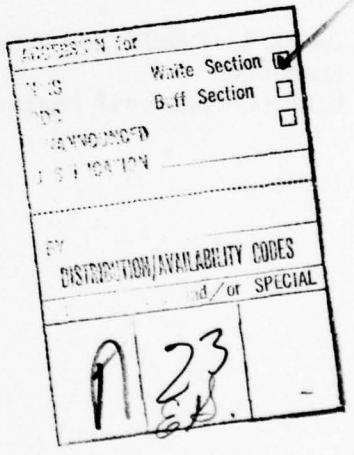

PREFACE

This report presents a summary of the results of a detailed Air Force Electronic Principles Survey of the Communications Electronics Systems Specialist, AFSC 30455.

The Electronic Principles Inventory (EPI) was developed by Major Thomas J. O'Connor and Mr. Hendrick W. Ruck and the survey data were analyzed by Captain Harold T. Welch. All are members of the Occupational Survey Branch, USAF Occupational Measurement Center, Lackland AFB, Texas.

Computer programs for analyzing the data were designed by Dr. Raymond E. Christal, Occupational and Manpower Research Division, Air Force Human Resources Laboratory (AFHRL), and were written by the Project Analysis and Programming Branch, Computational Sciences Division, AFHRL.

Distribution of this report is made upon request to the USAF Occupational Measurement Center, attention of the Chief, Occupational Survey Branch (OMY), Lackland AFB, Texas 78236.

This report has been reviewed and is approved.

JAMES A. TURNER, JR., Colonel, USAF
Commander
USAF Occupational Measurement Center

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ELECTRONIC PRINCIPLES OCCUPATIONAL SURVEY REPORT
COMMUNICATIONS ELECTRONICS SYSTEMS SPECIALIST
AFSC 30455

INTRODUCTION

This report summarizes the results of the administration of the Electronic Principles Inventory to airmen assigned as Communications Electronics Systems Specialist (AFSC 30455). The data for this report were collected during the period April through June 1977.

This report describes: (1) development and administration of the survey instrument; and (2) electronic principles used by DAFSC 5-skill level personnel both CONUS and overseas and assigned to selected major commands.

DEVELOPMENT OF THE ELECTRONIC PRINCIPLES INVENTORY (EPI)

The EPI was developed by personnel from the Occupational Survey Branch who were well qualified in theoretical physics and electronics, as well as in task analysis and survey development. Over 300 maintenance personnel from SAC, TAC, ADC, MAC, and AFCS participated in the development of the inventory. Representing the five ATC training centers, electronics experts who averaged 12 years of maintenance experience and four years of electronic principles instruction experience spent several weeks refining the EPI. In addition, personnel at the Electrical Engineering Department of the USAF Academy and the Air Force Human Resources Laboratory were consulted during the development of the inventory.

The final version of the EPI used in this survey contained 1,257 items in 62 subject matter areas covering all electronic principles training given at the five ATC technical training centers. Table 1 lists the 62 subject areas.

ADMINISTRATION

The Electronic Principles Inventory was administered by mail to AFSC 30455 airmen worldwide. Responses from 233 individuals represented 53 percent of the total of all AFSC 30455 personnel. Table 2 shows the percentage distribution by major command of the survey incumbents.

TABLE 1

EPI SUBJECT AREAS

SEQUENCE OF SUBJECT AREAS	SUBJECT AREA TITLE	BEGINNING ITEM NUMBER	GPSUM PAGE NUMBER
1	MATHEMATICS	A1	2
2	DIRECT CURRENT AND VOLTAGE	A15	2
3	RESISTANCE	A24	2
4	MULTIMETER USES	B52	3
5	ALTERNATING CURRENT	B61	4
6	INDUCTORS AND INDUCTIVE REACTANCE	B67	4
7	CAPACITORS AND CAPACITIVE REACTANCE	C92	5
8	TRANSFORMERS	C128	6
9	MAGNETISM	C171	7
10	RCL CIRCUITS	D185	8
11	SERIES AND PARALLEL RESONANCE (TIME CONSTANTS)	D229	10
12	FILTERS	D239	10
13	COUPLING	E261	11
14	SOLDERING	E273	11
15	RELAYS	E295	12
16	MICROPHONES	F314	12
17	SPEAKERS	F327	13
18	OSCILLOSCOPES	F342	13
19	SEMICONDUCTOR DIODES	G354	13
20	TRANSISTORS	G404	15
21	TRANSISTOR AMPLIFIERS	G428	16
22	SOLID-STATE SPECIAL PURPOSE DEVICES	H477	19
23	POWER SUPPLIES	H483	19
24	OSCILLATORS	H512	19
25	MULTIVIBRATORS	I539	20
26	LIMITERS AND CLAMPERS	I555	21
27	ELECTRON TUBES	I565	21
28	ELECTRON TUBE AMPLIFIERS AND CIRCUITS	J609	22
29	SPECIAL PURPOSE ELECTRON TUBES	J616	23
30	HETERODYNING, MODULATION, AND DEMODULATION	J632	23
31	AM SYSTEMS	K638	23
32	FM SYSTEMS	K666	24

TABLE 1 (CONTINUED)

EPI SUBJECT AREAS

SEQUENCE OF SUBJECT AREAS	SUBJECT AREA TITLE	BEGINNING ITEM NUMBER	GPSUM PAGE NUMBER
33	NUMBERING SYSTEMS	K685	25
34	LOGIC FUNCTIONS	L695	25
35	BOOLEAN EQUATIONS	L708	26
36	COUNTERS	L733	27
37	TIMING CIRCUITS	M757	27
38	USE OF SIGNAL GENERATORS	M769	28
39	MOTORS AND GENERATORS	M779	28
40	METER MOVEMENTS	N808	29
41	SATURABLE REACTORS AND MAGNETIC AMPLIFIERS	N818	29
42	WAVESHAPING CIRCUITS	N834	30
43	SINGLE SIDEBAND SYSTEMS	0845	30
44	PULSE MODULATION SYSTEMS	0875	31
45	ANTENNAS	0914	32
46	TRANSMISSION LINES	P953	34
47	WAVEGUIDES AND CAVITY RESONATORS	P984	35
48	MICROWAVE AMPLIFIERS AND OSCILLATORS	P1034	37
49	REGISTERS	Q1110	39
50	STORAGE DEVICES	Q1117	40
51	DIGITAL TO ANALOG CONVERTERS	Q1126	40
52	PHANTASTRONS	Q1140	41
53	SCHMITT TRIGGERS	R1141	41
54	CABLE FABRICATION	R1144	41
55	INPUT/OUTPUT DEVICES	S1146	41
56	PHOTO SENSITIVE DEVICES	S1149	41
57	SYNCHRONOUS VIBRATIONS (CHOPPER CIRCUITS)	S1150	41
58	INFRARED	T1159	41
59	LASERS	T1186	42
60	DISPLAY TUBES	T1220	43
61	PROGRAMMING	U1234	43
62	DB AND POWER RATIOS	U1255	44

TABLE 2

COMMAND REPRESENTATION OF SURVEY SAMPLE

	30455	
COMMAND	PERCENT ASSIGNED	PERCENT OF SAMPLE
AFCS	64	65
AFSC	7	9
TAC	6	6
ATC	2	5
PACAF	6	4
ADC	4	3
MAC	5	3
OTHERS	6	5
TOTAL	100	100

Total Assigned - 439
Total Sample - 233
Percent Sampled - 53%

PRESENTATON OF RESULTS

Personnel responded "yes" or "no" to the 1,257 electronic principles questions as related to their present job. A Group Summary (GPSUM) computer printout is provided in the Appendix portion of this report. Page 1 of the GPSUM lists the five selected groups identified for this report. Pages 2-44 show the percentage of the incumbents responding to the EPI items. The computer program results display the percent members answering "yes" to the subject area questions. The reader can locate a specific subject area by referring to the Appendix page number as listed in Table 1. For example, the Transformers area results are given on page 6 of the GPSUM. The percentage of survey respondents indicating use of specific electronic principles ranged from high in areas such as Multimeter Uses (p. 3) and Soldering (p. 11) to low in areas such as Infrared (pp. 41-42) and Display Tubes (p. 43). Additional AFSC 30455 data can be obtained upon request to the Chief, Occupational Survey Branch (OMY).

APPENDIX

TABULATION OF ELECTRONIC PRINCIPLES UTILIZATION DATA FOR SELECTED GROUPS
IN THE 30455 CAREER FIELD.

REPORTS ON THE FOLLOWING GROUPS WERE REQUESTED

GROUP IDENTITY =	SPC151	ALL AIRMEN DAFSC 30455	CONTAINING	233 MEMBERS.
GROUP IDENTITY =	SPC152	ALL AIRMEN DAFSC 30455 STATIONED IN CONUS	CONTAINING	213 MEMBERS.
GROUP IDENTITY =	SPC153	ALL AIRMEN DAFSC 30455 STATIONED OVERSEAS	CONTAINING	20 MEMBERS.
GROUP IDENTITY =	SPC154	ALL AIRMEN DAFSC 30455 ASSIGNED TO AFCS	CONTAINING	152 MEMBERS.
GROUP IDENTITY =	SPC155	ALL AIRMEN DAFSC 30455 ASSIGNED TO AFSC	CONTAINING	20 MEMBERS.

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
A	1	A1-01 IN YOUR PRESENT JOB• DO YOU USE INSTRUMENTS• SUCH AS METERS OR OSCILLOSCOPES, IN WHICH IT IS NECESSARY TO AMPLIFY OR ATTENUATE VOLTAGE, RESISTANCE, ETC•, BY POWERS OF 10•	84	84	90	82	95	MATHEMATICS
A	2	A1-02 DO YOU USE PUBLICATIONS• SUCH AS A TECHNICAL ORDERS OR MAINTENANCE MANUALS, IN WHICH IT IS NECESSARY FOR YOU TO MULTIPLY OR DIVIDE BY A POWER OF 10 BEFORE YOU CAN APPLY THE INFORMATION FROM THE PUBLICATION IN A USEFUL WAY ON THE JOB•	45	44	50	48	40	
A	3	A1-03 DO YOU REARRANGE AND SOLVE FORMULAS OR EQUATIONS•	41	43	25	45	45	
A	4	A1-04 DO YOU CALCULATE THE SQUARE ROOT OF A QUANTITY•	22	23	10	25	20	
A	5	A1-05 DO YOU SOLVE FOR UNKNOWN QUANTITIES•	39	40	25	42	35	
A	6	A1-06 DO YOU CONVERT NUMBERS TO LOGARITHMS•	9	10	0	9	10	
A	7	A1-07 DO YOU USE LOGARITHM TABLES IN ANY TYPE OF CALCULATIONS•	11	12	0	11	5	
A	8	A1-08 DO YOU SOLVE QUADRATIC EQUATIONS•	12	12	15	13	10	
A	9	A1-09 DO YOU USE THE NATURAL SYSTEM OF LOGARITHMS•	6	7	0	7	5	
A	10	A1-10 DO YOU PERFORM CALCULATIONS ON VECTOR QUANTITIES•	17	18	0	16	25	
A	11	A1-11 DO YOU WORK WITH TRIGONOMETRIC FUNCTIONS SUCH AS SINE, COSINE, OR TANGENT•	14	15	0	13	20	
A	12	A1-12 DO YOU DETERMINE AREAS OF PLANE FIGURES•	11	11	5	11	5	
A	13	A1-13 DO YOU SOLVE OR USE SIMULTANEOUS EQUATIONS•	12	13	5	14	10	
A	14	A1-14 DO YOU SOLVE OR USE PROPORTIONS•	24	25	10	27	15	
A	15	A2-01 DO YOU USE THE TERM VOLTAGE OR VOLT (V)•	94	94	95	93	95	DIRECT CURRENT AND VOLTAGE
A	16	A2-02 DO YOU USE THE TERM ELECTROMOTIVE FORCE (EMF)•	42	43	30	41	50	
A	17	A2-03 DO YOU USE THE TERM OHM•	93	93	95	91	95	
A	18	A2-04 DO YOU USE THE TERM ION•	26	28	10	28	20	
A	19	A2-05 DO YOU USE THE TERM DYNE•	9	10	0	9	10	
A	20	A2-06 DO YOU USE THE TERM AMPERE•	93	92	95	91	95	
A	21	A2-07 DO YOU USE THE TERM NEUTRON•	23	24	15	22	25	
A	22	A2-08 DO YOU USE THE TERM COULOMB•	21	22	15	21	25	
A	23	A2-09 DO YOU USE THE TERM PROTON•	22	23	15	22	20	
A	24	A3-01 DO YOU WORK WITH RESISTORS IN YOUR PRESENT JOB•	83	82	90	81	85	RESISTANCE
A	25	A3-02 DO YOU INSPECT RESISTORS•	91	90	100	90	95	
A	26	A3-03 DO YOU CLEAN RESISTORS•	84	84	85	86	85	
A	27	A3-04 DO YOU ADJUST RESISTORS•	88	88	90	88	95	
A	28	A3-05 DO YOU CHECK OHMIC VALUE OF RESISTORS•	91	90	100	90	95	
A	29	A3-06 DO YOU REMOVE OR REPLACE RESISTORS•	90	89	100	91	95	
A	30	A3-07 DO YOU USE OR REFER TO TEMPERATURE COEFFICIENTS FOR RESISTORS ON ANY TASKS YOU PERFORM•	30	33	5	34	35	
A	31	A3-08 DO YOU USE OR REFER TO RESISTOR SYMBOLS SUCH AS FIXED RESISTOR SYMBOLS OR TAPPED RESISTOR SYMBOLS•	91	90	95	88	95	
A	32	A3-09 DO YOU IDENTIFY OR CLASSIFY THE RESISTORS YOU WORK WITH AS CARBON, FIXED WIRE, SLIDE TAP, RHEOSTAT, OR POTENTIOMETER•	89	89	95	88	100	
A	33	A3-10 DO YOU USE RESISTOR COLOR CODES WHICH INDICATE OHMIC VALUE OF RESISTANCE•	92	92	100	91	100	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
A	34	A3-11 DO YOU USE RESISTOR COLOR CODES WHICH INDICATE TOLERANCE.	88	89	75	88	95	
A	35	A3-12 DO YOU USE RESISTOR COLOR CODES WHICH INDICATE FAILURE RATE.	21	23	0	26	20	
A	36	A3-13 DO YOU MAKE DECISIONS IN WHICH YOU MUST DETERMINE HOW TWO OR MORE BATTERIES MUST BE CONNECTED TOGETHER TO ACHIEVE A SPECIFIC VOLTAGE.	35	36	25	34	40	
A	37	A3-14 DO YOU USE OR REFER TO THE SCHEMATIC SYMBOLS WHICH REPRESENT BATTERIES, FUSES, CONDUCTORS, LAMPS, OR SWITCHES	91	91	95	89	95	
A	38	A3-15 DO YOU CALCULATE TOTAL RESISTANCE FOR SERIES RESISTIVE CIRCUITS.	69	70	50	72	60	
A	39	A3-16 DO YOU CALCULATE TOTAL CURRENT FOR SERIES RESISTIVE CIRCUITS.	58	60	40	61	60	
A	40	A3-17 DO YOU CALCULATE INDIVIDUAL VOLTAGE DROPS FOR SERIES RESISTIVE CIRCUITS.	68	69	60	70	60	
A	41	A3-18 DO YOU CALCULATE POWER DISSIPATION FOR SERIES RESISTIVE CIRCUITS.	52	53	40	55	50	
A	42	A3-19 DO YOU CALCULATE TOTAL RESISTANCE FOR SERIES PARALLEL RESISTIVE CIRCUITS.	64	67	35	68	60	
A	43	A3-20 DO YOU CALCULATE TOTAL CURRENT FOR SERIES PARALLEL RESISTIVE CIRCUITS.	55	57	35	57	60	
A	44	A3-21 DO YOU CALCULATE INDIVIDUAL VOLTAGE DROPS FOR SERIES PARALLEL RESISTIVE CIRCUITS.	63	64	45	65	60	
A	45	A3-22 DO YOU CALCULATE INDIVIDUAL BRANCH CURRENTS FOR SERIES PARALLEL RESISTIVE CIRCUITS.	52	54	30	51	60	
A	46	A3-23 DO YOU CALCULATE POWER DISSIPATION FOR SERIES PARALLEL RESISTIVE CIRCUITS.	48	49	35	49	50	
A	47	A3-24 DO YOU CALCULATE TOTAL RESISTANCE FOR PARALLEL RESISTIVE CIRCUITS.	65	67	45	68	60	
A	48	A3-25 DO YOU CALCULATE TOTAL CURRENT FOR PARALLEL RESISTIVE CIRCUITS.	55	57	40	57	60	
A	49	A3-26 DO YOU CALCULATE INDIVIDUAL VOLTAGE DROPS FOR PARALLEL RESISTIVE CIRCUITS.	63	64	45	65	60	
A	50	A3-27 DO YOU CALCULATE INDIVIDUAL BRANCH CURRENTS FOR PARALLEL RESISTIVE CIRCUITS.	51	53	30	49	60	
A	51	A3-28 DO YOU CALCULATE POWER DISSIPATION FOR PARALLEL RESISTIVE CIRCUITS.	48	50	35	51	50	
B	52	B1-01 DO YOU MEASURE RESISTANCE.	92	92	100	90	95	
B	53	B1-02 DO YOU REPAIR OHMMETERS.	9	9	5	6	5	
B	54	B1-03 DO YOU MEASURE VOLTAGE.	92	91	100	89	95	
B	55	B1-04 DO YOU REPAIR VOLTMETERS.	7	8	5	5	5	MULTIMETER USES
B	56	B1-05 DO YOU REPAIR AMMETERS.	7	8	0	6	5	
B	57	B1-06 DO YOU MEASURE CURRENT.	82	84	70	80	95	
B	58	B1-07 DO YOU USE MULTIMETERS.	91	90	100	89	95	
B	59	B1-08 DO YOU DIRECTLY USE A QUANTITY OF CHARGE CALLED A COULOMB.	8	8	0	8	5	
B	60	B1-09 DO YOU READ SCHEMATICS.	93	92	100	90	100	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

			DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
B	61	B2-01	DO YOU USE OR REFER TO THE TERM EFFECTIVE VOLTAGE (RMS).	76	76	75	76	80	ALTERNATING CURRENT
B	62	B2-02	DO YOU USE OR REFER TO THE TERM PEAK TO PEAK VOLTAGE.	87	88	80	86	90	
B	63	B2-03	DO YOU USE OR REFER TO THE TERM AVERAGE VOLTAGE (DC).	78	77	85	76	80	
B	64	B2-04	DO YOU USE OR REFER TO THE TERM WAVE LENGTH.	60	60	55	59	55	
B	65	B2-05	DO YOU USE OR REFER TO THE TERM FREQUENCY.	91	91	90	89	100	
B	66	B2-06	DO YOU USE OR REFER TO THE TERM INSTANTANEOUS VALUE.	36	36	35	33	50	
B	67	B3-01	DO YOU WORK WITH INDUCTORS OR CIRCUITS CONTAINING INDUCTORS, CHOKES, OR CHOKE COILS IN YOUR PRESENT JOB.	83	83	85	78	95	
B	68	B3-02	DO YOU INSPECT INDUCTORS.	85	85	80	85	90	
B	69	B3-03	DO YOU CLEAN INDUCTORS.	76	77	65	77	85	INDUCTORS AND INDUCTIVE REACTANCE
B	70	B3-04	DO YOU ADJUST INDUCTORS.	82	83	75	82	80	
B	71	B3-05	DO YOU REMOVE OR REPLACE INDUCTORS.	82	82	80	82	90	
B	72	B3-06	DO YOU USE OR REFER TO INDUCTANCE.	75	77	55	76	85	
B	73	B3-07	DO YOU USE OR REFER TO HENRIES.	64	67	40	64	80	
B	74	B3-08	DO YOU USE OR REFER TO INDUCTIVE REACTANCE.	56	58	35	57	55	
B	75	B3-09	DO YOU USE OR REFER TO COPPER LOSS IN INDUCTORS.	13	14	0	11	20	
B	76	B3-10	DO YOU USE OR REFER TO HYSTERESIS LOSS IN INDUCTORS.	19	20	5	14	25	
B	77	B3-11	DO YOU USE OR REFER TO EDDY CURRENT LOSS IN INDUCTORS	18	20	5	16	20	
B	78	B3-12	DO YOU USE OR REFER TO THE GENERAL RULE THAT INDUCTANCE IS PROPORTIONAL TO THE SQUARE OF THE NUMBER OF TURNS OF THE COIL.	18	19	5	17	10	
B	79	B3-13	DO YOU USE OR REFER TO THE GENERAL RULE THAT THE INDUCTANCE OF A COIL IS DIRECTLY PROPORTIONAL TO THE CROSS SECTIONAL AREA OF THE CORE.	15	16	0	14	15	
B	80	B3-14	DO YOU USE OR REFER TO THE GENERAL RULE THAT THE INDUCTANCE OF A COIL IS INVERSELY PROPORTIONAL TO ITS LENGTH.	13	14	5	13	5	
B	81	B3-15	DO YOU USE OR REFER TO THE GENERAL RULE THAT THE INDUCTANCE OF A COIL IS DIRECTLY PROPORTIONAL TO THE PERMEABILITY OF THE CORE MATERIAL.	15	16	0	13	15	
B	82	B3-16	DO YOU CALCULATE INDUCTANCE FOR PARTICULAR INDUCTORS USING FORMULAS.	16	17	5	17	15	
B	83	B3-17	DO YOU CALCULATE THE TOTAL INDUCTANCE FOR INDUCTANCE IN SERIES.	21	22	10	21	15	
B	84	B3-18	DO YOU CALCULATE THE TOTAL INDUCTANCE FOR INDUCTORS IN PARALLEL.	21	22	10	20	15	
B	85	B3-19	DO YOU CALCULATE THE TOTAL INDUCTANCE FOR INDUCTORS IN SERIES-PARALLEL CIRCUITS.	20	21	10	20	15	
B	86	B3-20	DO YOU USE OR REFER TO THE GENERAL RULE THAT CURRENT LAGS VOLTAGE IN AC INDUCTOR CIRCUITS.	40	42	25	38	40	
B	87	B3-21	DO YOU CALCULATE INDUCTIVE REACTANCE.	26	28	10	26	30	
B	88	B3-22	DO YOU USE OR REFER TO THE GENERAL RULE THAT INDUCTIVE REACTANCE IS DIRECTLY PROPORTIONAL TO FREQUENCY.	33	35	15	33	35	
B	89	B3-23	DO YOU WORK WITH POWER INDUCTORS.	45	46	40	45	55	
B	90	B3-24	DO YOU WORK WITH AUDIO FREQUENCY INDUCTORS.	70	70	70	67	80	
B	91	B3-25	DO YOU WORK WITH RADIO FREQUENCY INDUCTORS.	60	60	60	57	65	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
C	92	C1-01 DO YOU WORK WITH CAPACITORS OR CIRCUITS CONTAINING CAPACITORS IN YOUR PRESENT JOB.	82	81	90	78	80	
C	93	C1-02 DO YOU INSPECT CAPACITORS.	91	90	100	91	95	CAPACITORS AND CAPACITIVE REACTANCE
C	94	C1-03 DO YOU CLEAN CAPACITORS.	83	84	75	84	90	
C	95	C1-04 DO YOU ADJUST CAPACITORS.	88	86	100	86	90	
C	96	C1-05 DO YOU TEST CAPACITORS.	89	88	95	89	95	
C	97	C1-06 DO YOU DISCHARGE CAPACITORS.	89	89	90	89	95	
C	98	C1-07 DO YOU REMOVE OR REPLACE CAPACITORS.	89	88	100	90	95	
C	99	C1-08 DO YOU USE OR REFER TO DISTRIBUTED CAPACITANCE.	28	29	25	30	30	
C	100	C1-09 DO YOU USE OR REFER TO ORBITAL STRESS OF ELECTRONS IN A DIELECTRIC.	6	6	5	7	5	
C	101	C1-10 DO YOU USE OR REFER TO FARADS, MICROFARADS, OR PICOFARADS.	90	90	95	88	95	
C	102	C1-11 DO YOU USE OR REFER TO CAPACITANCE.	86	86	80	85	85	
C	103	C1-12 DO YOU USE OR REFER TO DIELECTRIC CONSTANT	22	22	20	21	20	
C	104	C1-13 DO YOU USE OR REFER TO WORKING VOLTAGE RATING OF CAPACITORS	87	86	95	84	100	
C	105	C1-14 DO YOU USE OR REFER TO CAPACITIVE REACTANCE	50	52	30	51	45	
C	106	C1-15 DO YOU USE OR REFER TO CAPACITOR COLOR CODES	60	62	45	61	80	
C	107	C1-16 DO YOU WORK WITH CAPACITORS IN DC CIRCUITS	88	88	95	86	90	
C	108	C1-17 DO YOU WORK WITH CAPACITORS IN AC CIRCUITS	87	86	100	84	80	
C	109	C1-18 DO YOU WORK WITH CAPACITORS IN CIRCUITS WITH BOTH DC AND AC	85	85	80	84	85	
C	110	C1-19 DO YOU WORK WITH CAPACITORS IN DON'T REMEMBER WHICH CIRCUITS	18	17	30	17	20	
C	111	C1-20 DO YOU CALCULATE CAPACITANCE FOR PARTICULAR CAPACITORS USING FORMULAS	21	23	10	23	15	
C	112	C1-21 DO YOU USE OR REFER TO THE GENERAL RULE THAT CAPACITANCE OF A CAPACITOR IS DIRECTLY PROPORTIONAL TO THE DIELECTRIC CONSTANT	13	13	10	12	20	
C	113	C1-22 DO YOU USE OR REFER TO THE GENERAL RULE THAT CAPACITANCE OF A CAPACITOR IS INVERSELY PROPORTIONAL TO THE DIELECTRIC THICKNESS	12	13	5	13	20	
C	114	C1-23 DO YOU CALCULATE THE TOTAL CAPACITANCE OF CAPACITORS IN SERIES	38	39	30	40	45	
C	115	C1-24 DO YOU CALCULATE THE TOTAL CAPACITANCE OF CAPACITORS IN PARALLEL	38	39	30	40	45	
C	116	C1-25 DO YOU CALCULATE THE TOTAL CAPACITANCE OF CAPACITORS IN SERIES-PARALLEL CIRCUITS	36	36	30	38	40	
C	117	C1-26 DO YOU USE OR REFER TO THE GENERAL RULE THAT CURRENT DOES NOT FLOW THROUGH CAPACITORS, IT ONLY APPEARS TO DO SO	58	59	45	56	55	
C	118	C1-27 DO YOU USE OR REFER TO THE GENERAL RULE THAT CURRENT LEADS VOLTAGE IN AC CAPACITOR CIRCUITS	39	40	35	36	40	
C	119	C1-28 DO YOU USE OR REFER TO THE GENERAL RULE THAT CAPACITIVE REACTANCE IS INVERSELY PROPORTIONAL TO FREQUENCY	35	35	30	32	45	
C	120	C1-29 DO YOU CALCULATE CAPACITIVE REACTANCE	24	26	5	26	30	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
C 121	C1-30	DO YOU WORK WITH ROTOR-STATOR (VARIABLE) CAPACITORS	74	74	75	72	75	
C 122	C1-31	DO YOU WORK WITH COMPRESSION (TRIMMER) CAPACITORS	80	79	90	78	80	
C 123	C1-32	DO YOU WORK WITH ELECTROLYTIC (FIXED) CAPACITORS	92	92	95	89	100	
C 124	C1-33	DO YOU WORK WITH PAPER (FIXED) CAPACITORS	88	89	75	87	100	
C 125	C1-34	DO YOU WORK WITH MICA (FIXED) CAPACITORS	89	90	85	88	100	
C 126	C1-35	DO YOU WORK WITH CERAMIC (FIXED) CAPACITORS	90	90	90	87	100	
C 127	C1-36	DO YOU WORK WITH DON'T REMEMBER WHICH TYPE OF CAPACITORS	13	13	15	14	10	
C 128	C2-01	DO YOU WORK WITH TRANSFORMERS IN YOUR PRESENT JOB	79	79	80	76	85	
C 129	C2-02	DO YOU INSPECT TRANSFORMERS	86	86	85	88	90	
C 130	C2-03	DO YOU CLEAN TRANSFORMERS	79	80	65	82	85	TRANSFORMERS
C 131	C2-04	DO YOU ADJUST TRANSFORMERS	48	51	25	51	55	
C 132	C2-05	DO YOU TROUBLESHOOT TRANSFORMERS	81	83	60	84	80	
C 133	C2-06	DO YOU REMOVE OR REPLACE COMPLETE TRANSFORMERS	86	86	85	88	90	
C 134	C2-07	DO YOU REMOVE OR REPLACE TRANSFORMER PARTS, SUCH AS THE PRIMARY WINDING	11	12	0	12	25	
C 135	C2-08	DO YOU MAKE A DISTINCTION BETWEEN MUTUAL INDUCTION AND MUTUAL INDUCTANCE (M)	12	12	5	9	25	
C 136	C2-09	DO YOU USE THE SYMBOL FOR MUTUAL INDUCTANCE, M	9	10	0	9	15	
C 137	C2-10	DO YOU REFER TO OR USE THE COEFFICIENT OF COUPLING WHEN WORKING WITH TRANSFORMERS	18	19	10	15	30	
C 138	C2-11	DO YOU CALCULATE TURNS RATIOS FOR TRANSFORMERS USING CURRENT OR VOLTAGE RATIOS	20	20	15	20	30	
C 139	C2-12	DO YOU REFER TO REFLECTED IMPEDANCE WHEN WORKING WITH TRANSFORMERS	21	20	25	20	20	
C 140	C2-13	DO YOU CALCULATE IMPEDANCE INTERACTIONS FOR TRANSFORMERS	13	14	0	13	15	
C 141	C2-14	DO YOU WORK WITH AUTOTRANSFORMERS	53	55	30	54	60	
C 142	C2-15	DO YOU WORK WITH POWER TRANSFORMERS	88	88	85	88	90	
C 143	C2-16	DO YOU WORK WITH AUDIO TRANSFORMERS	84	83	90	81	90	
C 144	C2-17	DO YOU WORK WITH RADIO FREQUENCY TRANSFORMERS	57	56	60	51	65	
C 145	C2-18	DO YOU WORK WITH DON'T REMEMBER WHAT TYPE OF TRANSFORMERS	14	13	20	15	15	
C 146	C2-19	DO YOU CHECK TRANSFORMERS FOR OPEN WINDINGS BY MEASURING RESISTANCE	88	88	95	87	90	
C 147	C2-20	DO YOU CHECK TRANSFORMERS FOR SHORTED WINDINGS BY MEASURING RESISTANCE	81	80	85	78	90	
C 148	C2-21	DO YOU CHECK TRANSFORMERS FOR SHORTED WINDINGS BY MEASURING OUTPUT VOLTAGES	73	75	60	73	80	
C 149	C2-22	DO YOU MEASURE RESISTANCE OF TRANSFORMER WINDINGS TO DETERMINE WHETHER A TRANSFORMER HAS A STEP-UP OR STEP-DOWN TURNS RATIO	40	41	35	39	30	
C 150	C2-23	DO YOU MEASURE OUTPUT VOLTAGE OF TRANSFORMERS TO DETERMINE WHETHER A TRANSFORMER HAS A STEP-UP OR STEP-DOWN TURNS RATIO	55	55	55	51	50	
C 151	C2-24	DO YOU REFER TO BASIC TRANSFORMER SCHEMATIC SYMBOLS FOR TRANSFORMERS	91	90	95	88	95	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
C 152	C2-25 DO YOU REFER TO MULTIPLE SECONDARY-WINDINGS SCHEMATIC SYMBOLS FOR TRANSFORMERS	82	81	90	79	85	
C 153	C2-26 DO YOU REFER TO MULTIPLE TAP SCHEMATIC SYMBOLS FOR TRANSFORMERS	85	84	90	83	80	
C 154	C2-27 DO YOU REFER TO CENTER TAP SCHEMATIC SYMBOLS FOR TRANSFORMERS	88	88	95	86	95	
C 155	C2-28 DO YOU REFER TO AIR CORE SCHEMATIC SYMBOLS FOR TRANSFORMERS	70	70	65	65	90	
C 156	C2-29 DO YOU REFER TO IRON CORE SCHEMATIC SYMBOLS FOR TRANSFORMERS	78	78	75	75	90	
C 157	C2-30 DO YOU REFER TO COMBINATIONS OF THE ABOVE SCHEMATIC SYMBOLS FOR TRANSFORMERS	74	73	80	70	85	
C 158	C2-31 DO YOU DETERMINE PHASE RELATIONSHIPS BETWEEN SECONDARY AND PRIMARY VOLTAGES OF TRANSFORMERS USING SCHEMATIC SYMBOLS	42	43	30	40	50	
C 159	C2-32 DO YOU DETERMINE OR REFER TO THE TYPE OF CORE IN TRANSFORMERS YOU WORK WITH	41	42	25	39	40	
C 160	C2-33 DO YOU REFER TO OR USE THE GENERAL RULE THAT THE TURNS RATIO OF A TRANSFORMER IS EQUAL TO THE VOLTAGE RATIO	31	31	30	30	25	
C 161	C2-34 DO YOU USE OR REFER TO STEP-UP OR STEP-DOWN RATIOS FOR TRANSFORMERS	50	50	55	49	55	
C 162	C2-35 DO YOU CALCULATE VOLTAGE RATIOS FOR TRANSFORMERS USING TURNS RATIOS	22	23	20	21	20	
C 163	C2-36 DO YOU CALCULATE CURRENT RATIOS FOR TRANSFORMERS USING TURNS RATIOS	20	21	10	19	20	
C 164	C2-37 DOES YOUR JOB INVOLVE ANY TASKS DEALING WITH THREE PHASE TRANSFORMERS	17	17	10	17	10	
C 165	C2-38 DO YOU INSPECT THREE PHASE TRANSFORMERS	12	13	10	15	10	
C 166	C2-39 DO YOU CLEAN OR LUBRICATE THREE PHASE TRANSFORMERS	9	9	5	11	10	
C 167	C2-40 DO YOU ADJUST THREE PHASE TRANSFORMERS	7	8	0	7	15	
C 168	C2-41 DO YOU TROUBLESHOOT THREE PHASE TRANSFORMERS	13	14	10	16	15	
C 169	C2-42 DO YOU REMOVE OR REPLACE COMPLETE THREE PHASE TRANSFORMERS	15	15	20	17	15	
C 170	C2-43 DO YOU REMOVE OR REPLACE THREE PHASE TRANSFORMER PARTS SUCH AS WINDINGS	5	5	0	5	15	
C 171	C3-01 DO YOU USE OR REFER TO PERMANENT MAGNETS	69	68	75	67	60	
C 172	C3-02 DO YOU USE OR REFER TO TEMPORARY MAGNETS	48	49	40	50	40	
C 173	C3-03 DO YOU USE OR REFER TO RETENTIVITY OF MAGNETIC MATERIALS	18	20	5	18	15	MAGNETISM
C 174	C3-04 DO YOU USE OR REFER TO RELUCTANCE OF MAGNETIC MATERIALS	17	18	5	15	15	
C 175	C3-05 DO YOU USE OR REFER TO PERMEABILITY OF MAGNETIC MATERIALS	20	22	5	20	20	
C 176	C3-06 DO YOU USE OR REFER TO RESIDUAL MAGNETISM	31	32	15	31	25	
C 177	C3-07 DO YOU USE OR REFER TO MAGNETIC LINES OF FORCE OR FLUX	41	42	25	43	25	
C 178	C3-08 DO YOU USE OR REFER TO WEBER'S THEORY OF MAGNETISM	10	11	0	10	5	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
C 179	C3-09	DO YOU USE OR REFER TO DOMAIN THEORY OF MAGNETISM	11	12	5	11	10	
C 180	C3-10	DO YOU USE OR REFER TO MAGNETIC INDUCTION	34	35	25	32	35	
C 181	C3-11	DO YOU USE OR REFER TO FLUX DENSITY	25	26	15	22	25	
C 182	C3-12	DO YOU USE OR REFER TO THE GENERAL RULE THAT FOR MAGNETIC POLES, LIKE POLES REPEL AND UNLIKE POLES ATTRACT	56	56	55	59	50	
C 183	C3-13	DO YOU USE THE LEFT HAND THUMB RULE TO FIND THE DIRECTION OF MAGNETIC FIELDS ABOUT STRAIGHT WIRES	26	27	15	26	25	
C 184	C3-14	DO YOU USE THE LEFT HAND THUMB RULE TO FIND THE NORTH POLE OF A CURRENT CARRYING COIL	21	23	10	20	25	
D 185	D1-01	DO YOU WORK WITH RC, LR, RCL CIRCUITS IN YOUR PRESENT JOB	67	67	75	63	75	
D 186	D1-02	DO YOU USE OR REFER TO VECTORS WHEN WORKING WITH RCL CIRCUITS	24	25	10	23	30	RCL CIRCUITS
D 187	D1-03	DO YOU USE OR REFER TO PYTHAGOREAN THEOREM WHEN WORKING WITH RCL CIRCUITS	12	13	0	11	10	
D 188	D1-04	DO YOU USE OR REFER TO SINE WHEN WORKING WITH RCL CIRCUITS	17	18	0	14	20	
D 189	D1-05	DO YOU USE OR REFER TO COSINE WHEN WORKING WITH RCL CIRCUITS	14	15	0	13	15	
D 190	D1-06	DO YOU USE OR REFER TO TANGENT WHEN WORKING WITH RCL CIRCUITS	14	15	0	12	15	
D 191	D1-07	DO YOU USE OR REFER TO WATTS WHEN WORKING WITH RCL CIRCUITS	46	46	50	43	50	
D 192	D1-08	DO YOU USE OR REFER TO TRUE POWER (PT) WHEN WORKING WITH RCL CIRCUITS	28	28	30	28	20	
D 193	D1-09	DO YOU USE OR REFER TO MAXIMUM POWER (PM) WHEN WORKING WITH RCL CIRCUITS	32	32	35	32	30	
D 194	D1-10	DO YOU USE OR REFER TO AVERAGE POWER (PAVE) WHEN WORKING WITH RCL CIRCUITS	30	30	35	30	20	
D 195	D1-11	DO YOU USE OR REFER TO APPARENT POWER (PA) WHEN WORKING WITH RCL CIRCUITS	24	25	10	23	20	
D 196	D1-12	DO YOU USE OR REFER TO POWER FACTOR (PF) WHEN WORKING WITH RCL CIRCUITS	27	27	25	26	25	
D 197	D1-13	DO YOU USE OR REFER TO RESONANT CIRCUITS WHEN WORKING WITH RCL CIRCUITS	64	65	55	64	60	
D 198	D1-14	DO YOU USE OR REFER TO BANDWIDTH WHEN WORKING WITH RCL CIRCUITS	67	67	65	66	60	
D 199	D1-15	DO YOU USE OR REFER TO SELECTIVITY WHEN WORKING WITH RCL CIRCUITS	57	57	60	57	55	
D 200	D1-16	DO YOU USE OR REFER TO RESONANT FREQUENCY WHEN WORKING WITH RCL CIRCUITS	61	62	60	62	55	
D 201	D1-17	DO YOU USE OR REFER TO HALF POWER POINTS WHEN WORKING WITH RCL CIRCUITS	23	23	20	21	10	
D 202	D1-18	DO YOU USE OR REFER TO BANDPASS REGION WHEN WORKING WITH RCL CIRCUITS	51	51	50	51	40	
D 203	D1-19	DO YOU USE OR REFER TO CIRCUIT Q WHEN WORKING WITH RCL CIRCUITS	40	42	25	41	45	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155
D 204	D1-20 DO YOU USE OR REFER TO TANK CIRCUITS WHEN WORKING WITH RCL CIRCUITS	65	67	45	67	60
D 205	D1-21 DO YOU DETERMINE VALUES OF TRIGONOMETRIC FUNCTIONS USING FORMULAS	9	9	5	8	5
D 206	D1-22 DO YOU DRAW VOLTAGE, CURRENT, OR IMPEDANCE VECTOR DIAGRAMS FOR CIRCUITS	14	15	0	11	15
D 207	D1-23 DO YOU CALCULATE TOTAL IMPEDANCE FOR CAPACITIVE CIRCUITS	21	22	5	23	15
D 208	D1-24 DO YOU CALCULATE PHASE ANGLES BETWEEN IMPEDANCE AND RESISTANCE IN CAPACITIVE CIRCUITS	10	10	5	9	10
D 209	D1-25 DO YOU CALCULATE TOTAL IMPEDANCE FOR SERIES RCL CIRCUITS	18	20	5	20	15
D 210	D1-26 DO YOU CALCULATE IMPEDANCE ANGLES FOR SERIES RCL CIRCUITS	10	11	5	9	10
D 211	D1-27 DO YOU CALCULATE APPARENT POWER (PA) FOR SERIES RCL CIRCUITS	12	12	10	11	10
D 212	D1-28 DO YOU CALCULATE TRUE POWER (PT) FOR SERIES RCL CIRCUITS	12	13	10	12	10
D 213	D1-29 DO YOU CALCULATE POWER FACTORS (PF) FOR SERIES RCL CIRCUITS	13	13	10	13	10
D 214	D1-30 DO YOU CALCULATE TOTAL CURRENT FOR PARALLEL RCL CIRCUITS	18	19	5	19	10
D 215	D1-31 DO YOU CALCULATE IMPEDANCE ANGLES FOR PARALLEL RCL CIRCUITS	9	9	5	8	5
D 216	D1-32 DO YOU CALCULATE TOTAL IMPEDANCE FOR PARALLEL RCL CIRCUITS USING THE ASSUMED VOLTAGE METHOD	12	13	0	13	15
D 217	D1-33 DO YOU CALCULATE TOTAL IMPEDANCE FOR PARALLEL RCL CIRCUITS USING OHM'S LAW	21	22	15	21	15
D 218	D1-34 DO YOU CHECK CAPACITORS USING OHMMETERS	72	72	70	68	75
D 219	D1-35 DO YOU CHECK CAPACITORS USING SUBSTITUTION	69	69	70	67	75
D 220	D1-36 DO YOU CHECK INDUCTORS USING OHMMETERS	71	71	70	67	75
D 221	D1-37 DO YOU CHECK INDUCTORS USING SUBSTITUTION	56	57	50	55	60
D 222	D1-38 DO YOU USE OR REFER TO THE GENERAL RULE THAT THETA= 0, PF = 1, AND PA = PT FOR RESONANT CIRCUITS	4	5	0	4	5
D 223	D1-39 DO YOU CALCULATE RESONANT FREQUENCIES FOR RCL CIRCUITS	22	23	10	23	20
D 224	D1-40 DO YOU USE OR REFER TO THE GENERAL RULE THAT IMPEDANCE IS MINIMUM AND CURRENT MAXIMUM AT THE RESONANT FREQUENCY FOR SERIES RCL CIRCUITS	32	33	25	31	35
D 225	D1-41 DO YOU USE OR REFER TO THE GENERAL RULE THAT LINE CURRENT IS MINIMUM AND IMPEDANCE MAXIMUM AT RESONANT FREQUENCY FOR PARALLEL RCL CIRCUITS	27	27	20	24	30
D 226	D1-42 DO YOU USE OR REFER TO THE GENERAL RULE THAT HALF POWER POINTS ARE AT 70.7 PERCENT OF THE PEAK CURRENT VALUE	26	27	20	24	25
D 227	D1-43 DO YOU USE OR REFER TO THE GENERAL RULE THAT BANDWIDTH IS INVERSELY PROPORTIONAL TO Q	31	33	15	32	35
D 228	D1-44 DO YOU DETERMINE HOW CHANGES IN FREQUENCY, RESISTANCE, CAPACITANCE, OR INDUCTANCE WILL AFFECT CURRENT OR PHASE ANGLES FOR RCL CIRCUITS	21	23	10	20	20

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
D 229	D2-01 IN YOUR PRESENT JOB, DO YOU WORK WITH, USE, OR REFER TO SERIES OR PARALLEL RESONANT CIRCUITS OR TIME CONSTANTS	46	49	15	47	55	SERIES AND PARALLEL RESONANCE (TIME CONSTANTS)
D 230	D2-02 DO YOU WORK WITH, USE, OR REFER TO TIME CONSTANTS	42	46	10	44	45	
D 231	D2-03 DO YOU WORK WITH, USE, OR REFER TO AVAILABLE VOLTAGE	28	31	5	30	25	
D 232	D2-04 DO YOU WORK WITH, USE, OR REFER TO TRANSIENT INTERVALS	25	27	5	24	20	
D 233	D2-05 DO YOU USE OR REFER TO THE GENERAL RULE THAT A CAPACITOR IS FULLY CHARGED (OR DISCHARGED) AFTER FIVE (5) TIME CONSTANTS (TC)	34	36	15	34	35	
D 234	D2-06 DO YOU USE OR REFER TO UNIVERSAL TIME CONSTANT CHARTS	14	15	5	14	10	
D 235	D2-07 DO YOU USE EQUATIONS OR FORMULAS TO DETERMINE CIRCUIT CURRENT OR COMPONENT VOLTAGES AFTER A SPECIFIC TIME FOR RC OR LR CIRCUITS	16	17	5	16	10	
D 236	D2-08 DO YOU USE EQUATIONS OR FORMULAS TO DETERMINE THE TIME REQUIRED FOR CIRCUIT CURRENT OR COMPONENT VOLTAGES TO REACH SPECIFIC VALUES FOR RC OR LR CIRCUITS	15	16	5	14	10	
D 237	D2-09 DO YOU USE EQUATIONS OR FORMULAS TO DETERMINE COMPONENT VALUES REQUIRED FOR CIRCUIT CURRENT AND COMPONENT VOLTAGES TO REACH SPECIFIC VALUES IN SPECIFIC TIMES	14	15	5	13	10	
D 238	D2-10 DO YOU USE OR REFER TO THE GENERAL RULE THAT CURRENT IN LR CIRCUITS REACHES ITS MINIMUM VALUE (OR ZERO) AFTER FIVE (5) TIME CONSTANTS	20	21	10	18	15	
D 239	D3-01 DO YOU WORK WITH CIRCUITS USED AS FILTERS IN YOUR PRESENT JOB	77	78	70	76	75	FILTERS
D 240	D3-02 DO YOU INSPECT FILTER CIRCUITS	74	75	65	75	75	
D 241	D3-03 DO YOU CLEAN FILTER CIRCUITS	67	68	50	68	65	
D 242	D3-04 DO YOU ALIGN OR ADJUST FILTER CIRCUITS	56	57	50	57	50	
D 243	D3-05 DO YOU TROUBLESHOOT TO THE FILTER CIRCUIT LEVEL	69	69	60	68	70	
D 244	D3-06 DO YOU TROUBLESHOOT TO COMPONENT PARTS	72	73	65	72	75	
D 245	D3-07 DO YOU REMOVE OR REPLACE THE COMPLETE FILTER CIRCUIT	58	59	50	57	70	
D 246	D3-08 DO YOU REMOVE OR REPLACE FILTER CIRCUIT COMPONENT PARTS	73	75	60	74	75	
D 247	D3-09 DO YOU WORK WITH LOW PASS FILTERS	73	74	65	72	75	
D 248	D3-10 DO YOU WORK WITH HIGH PASS FILTERS	74	75	60	73	70	
D 249	D3-11 DO YOU WORK WITH BANDPASS FILTERS	72	73	60	71	70	
D 250	D3-12 DO YOU WORK WITH BAND-REJECT FILTERS	48	49	40	47	40	
D 251	D3-13 DON'T REMEMBER WHICH TYPE OF FILTER YOU WORK WITH	13	13	15	14	20	
D 252	D3-14 DO YOU WORK WITH L-SECTION FILTER CONFIGURATION	46	47	30	45	50	
D 253	D3-15 DO YOU WORK WITH T-SECTION FILTER CONFIGURATION	43	45	25	43	55	
D 254	D3-16 DO YOU WORK WITH PI-SECTION FILTER CONFIGURATION	37	38	20	34	45	
D 255	D3-17 DON'T REMEMBER WHICH TYPE FILTER CONFIGURATION	25	24	40	26	15	
D 256	D3-18 DO THE FILTERS YOU WORK WITH USE PARALLEL RESONANT CIRCUITS	58	59	45	58	55	
D 257	D3-19 DO THE FILTERS YOU WORK WITH USE SERIES-PARALLEL CIRCUITS	59	61	40	59	55	
D 258	D3-20 DO THE FILTERS YOU WORK WITH USE SERIES RESONANT CIRCUITS	58	59	45	57	55	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
D 259	D3-21	DON'T REMEMBER WHICH TYPE OF BASIC CIRCUIT	23	23	25	23	20	
D 260	D3-22	DO YOU USE EQUATIONS OR FORMULAS TO DETERMINE CAPACITANCE OR INDUCTANCE VALUES REQUIRED FOR SPECIFIC FILTERS	19	20	5	18	20	
E 261	E1-01	DO YOU WORK WITH COUPLING DEVICES IN YOUR PRESENT JOB	82	81	85	78	80	
E 262	E1-02	DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH RC COUPLING	78	78	80	76	80	
E 263	E1-03	DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH IMPEDANCE COUPLING	75	75	75	73	80	COUPLING
E 264	E1-04	DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH TRANSFORMER COUPLING	79	78	80	76	85	
E 265	E1-05	DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM RC COUPLING	77	77	85	74	80	
E 266	E1-06	DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM IMPEDANCE COUPLING	74	74	75	70	80	
E 267	E1-07	DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM TRANSFORMER COUPLING	77	77	80	74	85	
E 268	E1-08	DO YOU WORK WITH DIRECTLY COUPLED CIRCUITS	81	80	85	76	85	
E 269	E1-09	DO YOU WORK WITH CAPACITIVE-RESISTIVE COUPLED CIRCUITS	77	77	85	73	80	
E 270	E1-10	DO YOU WORK WITH CAPACITIVE-INDUCTIVE COUPLED CIRCUITS	76	77	75	72	80	
E 271	E1-11	DO YOU WORK WITH TRANSFORMER COUPLED CIRCUITS	79	78	85	74	85	
E 272	E1-12	DON'T REMEMBER WHICH TYPE OF COUPLING CIRCUITS	12	12	10	13	5	
E 273	E2-01	IN YOUR PRESENT JOB, DO YOU PERFORM SOLDERING TECHNIQUES OR INSPECT OR EVALUATE SOLDERED CONNECTIONS	87	86	95	88	100	
E 274	E2-02	DO YOU SELECT TYPE OF SOLDER TO USE	73	73	65	73	80	
E 275	E2-03	DO YOU ADD FLUX TO CONNECTIONS	70	70	75	69	85	
E 276	E2-04	DO YOU CLEAN CONNECTIONS USING SOLVENTS	80	80	80	82	85	
E 277	E2-05	DO YOU STRIP INSULATION FROM WIRES	89	88	100	89	95	
E 278	E2-06	DO YOU CONNECT OR DISCONNECT HEAT SINKS	87	86	95	88	95	
E 279	E2-07	DO YOU BEND OR SHAPE WIRES OR LEADS	89	88	100	89	95	
E 280	E2-08	DO YOU CUT WIRES	89	88	100	89	95	
E 281	E2-09	DO YOU FILE OR SHAPE SOLDERING IRON TIPS	78	78	70	82	75	
E 282	E2-10	DO YOU TIN SOLDERING IRON TIPS	86	86	90	87	95	
E 283	E2-11	DO YOU CLEAN SOLDERING IRON TIPS	89	88	100	89	95	
E 284	E2-12	DO YOU CLEAN ELECTRICAL SURFACES USING ERASERS	85	85	80	86	90	
E 285	E2-13	DO YOU TIN OR PRE-TIN CONDUCTORS	86	85	90	87	95	
E 286	E2-14	DO YOU INSPECT SOLDERED CONNECTIONS	89	88	100	89	95	
E 287	E2-15	DO YOU DESOLDER CONNECTIONS BY WICKING	64	65	50	66	90	
E 288	E2-16	DO YOU DESOLDER CONNECTIONS USING VACUUM DESOLDERING TOOLS	79	79	85	79	90	
E 289	E2-17	DO YOU CUT COMPONENT LEADS TO REMOVE COMPONENTS	66	66	65	67	70	
E 290	E2-18	DO YOU CRUSH COMPONENTS FOR REMOVAL	27	27	20	27	35	

SOLDERING

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
E 291	E2-19	DO YOU MAKE HARDWIRE CONNECTIONS	85	85	90	86	95	
E 292	E2-20	DO YOU MAKE PRINTED CIRCUIT BOARD CONNECTIONS	88	87	100	89	95	
E 293	E2-21	DO YOU SOLDER PASSIVE COMPONENTS SUCH AS RESISTORS OR CAPACITORS ON PRINTED CIRCUIT BOARDS	88	86	100	88	90	
E 294	E2-22	DO YOU SOLDER ACTIVE COMPONENTS SUCH AS SOLID-STATE DIODES OR TRANSISTORS ON PRINTED CIRCUIT BOARDS	88	87	100	89	95	
E 295	E3-01	DO YOU WORK WITH RELAYS ON YOUR PRESENT JOB	76	75	90	71	80	
E 296	E3-02	DO YOU ADJUST RELAYS	43	45	30	44	45	
E 297	E3-03	DO YOU CLEAN RELAYS	66	66	70	64	70	
E 298	E3-04	DO YOU INSPECT RELAYS	73	71	90	68	80	
E 299	E3-05	DO YOU REMOVE OR REPLACE COMPLETE RELAYS	70	69	80	68	75	
E 300	E3-06	DO YOU REMOVE OR REPLACE PARTS OR RELAYS	24	26	5	26	35	RELAYS
E 301	E3-07	DO YOU TROUBLESHOOT RELAYS	71	70	80	69	65	
E 302	E3-08	DO YOU STRAIGHTEN RELAY CONTACTS	52	53	50	53	45	
E 303	E3-09	DO YOU PERFORM TASKS ON RELAY CONTACTS	60	59	75	57	65	
E 304	E3-10	DO YOU PERFORM TASKS ON RELAY CORES	17	18	5	17	25	
E 305	E3-11	DO YOU PERFORM TASKS ON RELAY COILS	20	22	5	20	30	
E 306	E3-12	DO YOU PERFORM TASKS ON RELAY ARMATURES	26	27	15	25	35	
E 307	E3-13	DO YOU PERFORM TASKS ON RELAY SPRINGS	34	35	25	33	35	
E 308	E3-14	DO YOU USE OR REFER TO SINGLE POLE, SINGLE THROW (SPST), NORMALLY OPER (NO) SCHEMATIC SYMBOLS FOR RELAYS	62	62	60	56	70	
E 309	E3-15	DO YOU USE OR REFER TO SINGLE POLE, SINGLE THROW (SPST), NORMALLY CLOSED (NC) SCHEMATIC SYMBOLS FOR RELAYS	61	61	55	55	75	
E 310	E3-16	DO YOU USE OR REFER TO SINGLE POLE, DOUBLE THROW (SPDT) SCHEMATIC SYMBOLS FOR RELAYS	60	60	55	53	70	
E 311	E3-17	DO YOU USE OR REFER TO DOUBLE POLE, DOUBLE THROW (DPDT) SCHEMATIC SYMBOLS FOR RELAYS	60	61	55	53	70	
E 312	E3-18	DO YOU USE OR REFER TO OTHER RELAY SYMBOLS SCHEMATIC SYMBOLS FOR RELAYS	55	54	60	50	65	
E 313	E3-19	DO YOU CHECK ELECTRICAL CONTINUITY OF COILS BY MEASURING RESISTANCE	70	70	65	66	75	
F 314	F1-01	IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS DEALING WITH MICROPHONES	76	77	60	78	90	
F 315	F1-02	DO YOU INSPECT MICROPHONES	73	74	60	75	90	
F 316	F1-03	DO YOU CLEAN MICROPHONES	64	65	55	66	85	
F 317	F1-04	DO YOU OPERATE MICROPHONES	71	73	50	73	85	MICROPHONES
F 318	F1-05	DO YOU TROUBLESHOOT AS FAR AS CHECKING WIRE CONNECTIONS BUT DO NOT TROUBLESHOOT DOWN TO COMPONENT PARTS OR MICROPHONES	56	56	55	56	65	
F 319	F1-06	DO YOU TROUBLESHOOT DOWN TO MICROPHONE PARTS	46	48	25	48	55	
F 320	F1-07	DO YOU REMOVE OR REPLACE COMPLETE MICROPHONES	71	73	55	74	80	
F 321	F1-08	DO YOU REMOVE OR REPLACE MICROPHONE PARTS	42	43	30	44	50	
F 322	F1-09	DO YOU PERFORM TASKS ON CARBON MICROPHONES	50	51	40	51	50	
F 323	F1-10	DO YOU PERFORM TASKS ON CAPACITOR MICROPHONES	28	29	15	28	35	
F 324	F1-11	DO YOU PERFORM TASKS ON CRYSTAL MICROPHONES	29	30	20	28	25	
F 325	F1-12	DO YOU PERFORM TASKS ON DYNAMIC MICROPHONES	61	62	55	61	85	
F 326	F1-13	DO YOU PERFORM TASKS ON VELOCITY RIBBON MICROPHONES	21	21	25	20	25	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
F 327	F2-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS DEALING WITH SPEAKERS	76	77	70	78	90	
F 328	F2-02 DO YOU INSPECT SPEAKERS	73	73	65	76	85	
F 329	F2-03 DO YOU CLEAN SPEAKERS	61	63	40	66	75	
F 330	F2-04 DO YOU OPERATE SPEAKERS	72	73	55	74	86	SPEAKERS
F 331	F2-05 DO YOU TROUBLESHOOT AS FAR AS CHECKING WIRE CONNECTIONS BUT DO NOT TROUBLESHOOT DOWN TO COMPONENT PARTS OF SPEAKERS	67	67	65	67	70	
F 332	F2-06 DO YOU TROUBLESHOOT DOWN TO SPEAKER PARTS	29	31	5	32	35	
F 333	F2-07 DO YOU REMOVE OR REPLACE COMPLETE SPEAKERS	73	74	65	76	80	
F 334	F2-08 DO YOU REMOVE OR REPLACE SPEAKER PARTS	18	18	10	16	40	
F 335	F2-09 DO YOU PERFORM ANY TASKS ON SPEAKER CONES	18	17	20	17	25	
F 336	F2-10 DO YOU PERFORM ANY TASKS ON SPEAKER SPIDERS	6	7	0	7	10	
F 337	F2-11 DO YOU PERFORM ANY TASKS ON SPEAKER FIELD COILS	9	10	5	10	15	
F 338	F2-12 DO YOU PERFORM ANY TASKS ON SPEAKER VOICE COILS	14	14	10	14	25	
F 339	F2-13 DO YOU PERFORM ANY TASKS ON SPEAKER PERMANENT MAGNETS	13	14	5	14	20	
F 340	F2-14 DO YOU PERFORM ANY TASKS ON SPEAKER ELECTROMAGNETS	12	12	5	13	15	
F 341	F2-15 DO YOU PERFORM ANY TASKS ON SPEAKER SOFT IRON CORES	9	10	0	11	15	
F 342	F3-01 DO YOU USE OSCILLOSCOPES IN YOUR PRESENT JOB	91	90	95	89	95	
F 343	F3-02 DO YOU USE OSCILLOSCOPES TO PERFORM OPERATIONAL CHECKS	90	90	90	89	85	
F 344	F3-03 DO YOU USE OSCILLOSCOPES TO PERFORM ALIGNMENTS OR ADJUSTMENTS	88	88	90	86	95	OSCILLOSCOPES
F 345	F3-04 DO YOU USE OSCILLOSCOPES TO TROUBLESHOOT ELECTRONIC CIRCUITS	90	89	100	87	95	
F 346	F3-05 DO YOU USE OSCILLOSCOPES TO MEASURE FREQUENCY	80	82	65	83	75	
F 347	F3-06 DO YOU USE OSCILLOSCOPES TO MEASURE TIME	79	80	60	80	85	
F 348	F3-07 DO YOU USE OSCILLOSCOPES TO OBSERVE LISAJOUS PATTERNS	37	38	25	37	50	
F 349	F3-08 DO YOU USE OSCILLOSCOPES TO OBSERVE SIGNALS WHILE UTILIZING ATTENUATOR PROBES	87	87	90	86	90	
F 350	F3-09 DO YOU USE OSCILLOSCOPES TO MAKE FREQUENCY OR TIME MEASUREMENTS USING DELAY TIME MULTIPLIERS	69	70	55	72	70	
F 351	F3-10 DO YOU USE OSCILLOSCOPES TO MEASURE AC VOLTAGE	82	84	70	83	90	
F 352	F3-11 DO YOU USE OSCILLOSCOPES TO MEASURE OR OBSERVE SIGNALS AFTER FIRST ADJUSTING THE GAIN AND DC BAL CONTROLS	77	79	55	78	80	
F 353	F3-12 DO YOU USE OSCILLOSCOPES TO MEASURE DC VOLTAGE	88	87	100	86	90	
G 354	G1-01 DO YOU WORK WITH SEMICONDUCTOR DIODES IN YOUR PRESENT JOB	88	88	95	84	95	
G 355	G1-02 DO YOU INSPECT DIODES	88	88	90	86	95	
G 356	G1-03 DO YOU REMOVE OR REPLACE DIODES	87	86	95	87	90	
G 357	G1-04 DO YOU CHECK DIODES USING AN INSTRUMENT	89	88	95	87	90	SEMICONDUCTOR DIODES
G 358	G1-05 DO YOU USE ENERGY LEVEL DIAGRAMS IN YOUR WORK WITH DIODES	8	8	10	5	10	
G 359	G1-06 DO YOU USE PN JUNCTION DIODE CHARACTERISTIC CURVES, TOGETHER WITH VALUES OF FORWARD AND REVERSE BIAS VOLTAGE, TO COMPUTE FORWARD OR REVERSE BIAS RESISTANCE	21	21	15	23	5	
G 360	G1-07 DO YOU COMPUTE FORWARD OR REVERSE BIAS RESISTANCE FOR DIODES	31	32	15	32	30	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155
G 361	G1-08 DO YOU USE OR REFER TO THE GENERAL RULE THAT TEMPERATURE CAN AFFECT THE OPERATION OF DIODES	71	71	75	72	70
G 362	G1-09 DO YOU IDENTIFY SEMICONDUCTOR DIODES AS OPPOSED TO OTHER ELECTRONIC COMPONENTS, SUCH AS RESISTORS, BASED ON THEIR PHYSICAL APPEARANCE	83	83	85	82	80
G 363	G1-10 DO YOU REFER TO OR DO YOU DETERMINE THE GENERAL EFFECTS OF DOPING ON CURRENT FLOW	21	21	15	20	25
G 364	G1-11 DO YOU USE OR REFER TO MEASUREMENTS OF FORWARD BIAS RESISTANCE	78	79	65	77	75
G 365	G1-12 DO YOU USE OR REFER TO DIODE COLOR CODING	54	54	55	51	65
G 366	G1-13 DO YOU USE OR REFER TO CENTRIFUGAL FORCE OF AN ELECTRON IN ORBIT AROUND A NUCLEUS	7	8	5	6	10
G 367	G1-14 DO YOU USE OR REFER TO CENTRIPETAL FORCE OF AN ELECTRON IN ORBIT AROUND A NUCLEUS	6	7	5	5	10
G 368	G1-15 DO YOU USE OR REFER TO DIODE NUMBERING SYSTEM, SUCH AS IN 538	81	81	85	79	95
G 369	G1-16 DO YOU USE OR REFER TO KINETIC ENERGY OF AN ELECTRON MOVING IN ORBIT	8	8	5	9	10
G 370	G1-17 DO YOU USE OR REFER TO POTENTIAL ENERGY OF AN ELECTRON MOVING IN ORBIT	9	10	5	9	10
G 371	G1-18 DO YOU USE OR REFER TO MEASUREMENTS OF REVERSE BIAS RESISTANCE	79	80	65	77	85
G 372	G1-19 DO YOU USE OR REFER TO NUMBER OF ELECTRONS IN A PARTICULAR SHELL OR ORBIT	12	12	5	11	10
G 373	G1-20 DO YOU USE OR REFER TO PERMISSIBLE ENERGY LEVELS OF AN ORBITING ELECTRON	6	6	5	5	10
G 374	G1-21 DO YOU USE OR REFER TO FORBIDDEN ENERGY LEVELS OF AN ORBITING ELECTRON	6	6	5	5	10
G 375	G1-22 DO YOU USE OR REFER TO VALENCE ELECTRONS (THOSE IN THE OUTERMOST SHELL)	13	14	5	14	10
G 376	G1-23 DO YOU USE OR REFER TO ATOMIC NUMBER (TOTAL NUMBER OF ELECTRONS IN ATOM)	11	12	5	12	10
G 377	G1-24 DO YOU USE OR REFER TO SYMBOLS ON THE DIODE WHICH INDICATE THE CATHODE END	85	85	85	81	90
G 378	G1-25 DO YOU NEED TO KNOW WHICH MATERIALS ARE USED IN THE CONSTRUCTION OF DIODES SUCH AS GERMANIUM OR SILICON	48	48	45	47	55
G 379	G1-26 DO YOU NEED TO KNOW THAT SEMICONDUCTORS HAVE NEGATIVE TEMPERATURE COEFFICIENTS OF RESISTANCE (AS TEMPERATURE INCREASES RESISTANCE DECREASES)	46	47	35	46	50
G 380	G1-27 DO YOU USE OR REFER TO PN JUNCTION DIODE CHARACTERISTIC CURVES, SUCH AS VOLTAGE - CURRENT CHARACTERISTIC CURVES (PERHAPS YOU DO THIS TO IDENTIFY POINTS OF STRUCTURAL BREAKDOWN OR OPERATING REGIONS)	24	24	20	26	15
G 381	G1-28 DO YOU DETERMINE WHETHER PN JUNCTION DIODES ARE FORWARD BIASED OR REVERSE BIASED WHEN YOU READ OR INTERPRET CIRCUIT DIAGRAMS	71	72	65	70	65
G 382	G1-29 DO YOU USE OR REFER TO VALENCE BAND IN SEMICONDUCTOR MATERIALS	13	13	10	13	10

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
G 383	G1-30	DO YOU USE OR REFER TO FORBIDDEN BAND IN SEMICONDUCTOR MATERIALS	8	8	5	7	5	
G 384	G1-31	DO YOU USE OR REFER TO CONDUCTION BAND IN SEMICONDUCTOR MATERIALS	10	11	5	9	10	
G 385	G1-32	DO YOU USE OR REFER TO COVALENT BONDING IN SEMICONDUCTOR MATERIALS	12	13	5	13	5	
G 386	G1-33	DO YOU USE OR REFER TO ELECTRON-HOLE PAIR CREATED IN SEMICONDUCTORS	13	14	5	13	5	
G 387	G1-34	DO YOU USE OR REFER TO ELECTRON FLOW OR HOLE FLOW IN SEMICONDUCTORS	21	22	10	22	15	
G 388	G1-35	DO YOU USE OR REFER TO DONOR IMPURITY IN SEMICONDUCTORS	14	15	5	14	10	
G 389	G1-36	DO YOU USE OR REFER TO ACCEPTOR IMPURITY IN SEMICONDUCTORS	14	15	5	14	10	
G 390	G1-37	DO YOU USE OR REFER TO P-TYPE SEMICONDUCTOR MATERIAL	45	46	45	45	45	
G 391	G1-38	DO YOU USE OR REFER TO N-TYPE SEMICONDUCTOR MATERIAL	46	46	45	47	45	
G 392	G1-39	DO YOU USE OR REFER TO MAJORITY CARRIERS IN SEMICONDUCTORS	18	18	10	18	15	
G 393	G1-40	DO YOU USE OR REFER TO MINORITY CARRIERS IN SEMICONDUCTORS	17	18	10	17	15	
G 394	G1-41	DO YOU USE OR REFER TO JUNCTION RECOMBINATION IN SEMICONDUCTORS	13	13	15	11	10	
G 395	G1-42	DO YOU USE OR REFER TO DEPLETION REGION IN SEMICONDUCTORS	20	20	15	20	10	
G 396	G1-43	DO YOU USE OR REFER TO RELATIONSHIP BETWEEN BARRIER WIDTH AND DIFFERENCE OF POTENTIAL	15	16	5	15	10	
G 397	G1-44	DO YOU USE OR REFER TO THE 10:1 BACK TO FRONT RESISTANCE RATIO FOR DIODES	77	77	75	73	85	
G 398	G1-45	DO YOU USE OR REFER TO BARRIER HEIGHT IN SEMICONDUCTORS	10	11	5	11	10	
G 399	G1-46	DO YOU USE OR REFER TO DIODE SUBSTITUTION INFORMATION	75	74	85	72	95	
G 400	G1-47	DO YOU USE OR REFER TO MAXIMUM AVERAGE FORWARD CURRENT DIODE RATINGS	42	44	25	42	55	
G 401	G1-48	DO YOU USE OR REFER TO PEAK RECURRENT FORWARD CURRENT DIODE RATINGS	35	36	20	34	55	
G 402	G1-49	DO YOU USE OR REFER TO MAXIMUM SURGE CURRENT DIODE RATINGS	38	39	25	37	55	
G 403	G1-50	DO YOU USE OR REFER TO PEAK REVERSE (INVERSE) VOLTAGE DIODE RATINGS	54	54	50	51	60	
G 404	G2-01	DO YOU WORK WITH TRANSISTORS IN YOUR PRESENT JOB.	91	91	95	89	100	
G 405	G2-02	DO YOU INSPECT TRANSISTORS	90	90	95	89	100	
G 406	G2-03	DO YOU REMOVE OR REPLACE TRANSISTORS	89	88	100	89	95	
G 407	G2-04	DO YOU CHECK TRANSISTORS USING AN INSTRUMENT	90	89	100	88	95	TRANSISTORS
G 408	G2-05	DO YOU USE OR REFER TO EMITTER - BASE (EB) FORWARD AND REVERSE RESISTANCE MEASUREMENTS	90	89	95	88	95	
G 409	G2-06	DO YOU USE OR REFER TO COLLECTOR - BASE (CB) FORWARD AND REVERSE RESISTANCE MEASUREMENTS	89	89	90	88	95	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
G 410	G2-07	DO YOU USE OR REFER TO EMITTER - COLLECTOR (EC) RESISTANCE MEASUREMENTS	88	88	85	87	90	
G 411	G2-08	DO YOU USE OR REFER TO HOW BIASING AFFECTS THE PHYSICAL BARRIER WIDTH OF THE EMITTER - BASE JUNCTION	34	35	20	36	30	
G 412	G2-09	DO YOU USE OR REFER TO HOW BIASING AFFECTS THE PHYSICAL BARRIER WIDTH OF THE COLLECTOR - BASE JUNCTION	33	34	20	34	30	
G 413	G2-10	DO YOU USE OR REFER TO THE PHYSICAL SIZE OF THE TRANSISTOR STRUCTURE (COLLECTOR, BASE AND EMITTER)	64	63	70	63	65	
G 414	G2-11	DO YOU USE OR REFER TO LEAKAGE CURRENT (ICBO) IN A TRANSISTOR	45	46	40	43	55	
G 415	G2-12	DO YOU USE OR REFER TO TRANSISTOR SCHEMATIC SYMBOLS	91	90	100	88	95	
G 416	G2-13	DO YOU USE OR REFER TO TRANSISTOR NOTATION SUCH AS Q1, Q2, Q3, ETC	92	91	100	89	100	
G 417	G2-14	DO YOU USE OR REFER TO TRANSISTOR SUBSTITUTION INFORMATION	84	83	90	83	100	
G 418	G2-15	DO YOU USE OR REFER TO THE GENERAL RULE THAT THE TRANSISTOR BASE CURRENT IB IS NORMALLY SIGNIFICANTLY SMALLER THAN THE EMITTER CURRENT IE (USUALLY IB BEING 2 TO 8 PERCENT OF IE)	43	44	30	47	45	
G 419	G2-16	DO YOU USE THE INFORMATION THAT THE EFFECT OF EMITTER BASE VOLTAGE ON BASE CURRENT IS THE CONTROLLING FACTOR FOR TRANSISTORS	57	58	50	57	60	
G 420	G2-17	DO YOU USE THE GENERAL RULE THAT LEAKAGE CURRENT (ICBO) IN A TRANSISTOR INCREASES AS TEMPERATURE INCREASES	42	42	40	42	45	
G 421	G2-18	DO YOU USE OR REFER TO TRANSISTOR CHARACTERISTIC CURVES	29	29	25	28	30	
G 422	G2-19	DO YOU USE OR REFER TO BETA TRANSISTOR GAINS	34	34	35	35	35	
G 423	G2-20	DO YOU USE OR REFER TO ALPHA TRANSISTOR GAINS	28	28	25	29	30	
G 424	G2-21	DO YOU USE OR REFER TO GAMMA TRANSISTOR GAINS	25	25	20	28	25	
G 425	G2-22	DO YOU CALCULATE BETA TRANSISTOR GAINS	14	14	10	13	5	
G 426	G2-23	DO YOU CALCULATE ALPHA TRANSISTOR GAINS	12	13	5	13	5	
G 427	G2-24	DO YOU CALCULATE GAMMA TRANSISTOR GAINS	9	9	0	9	5	
G 428	G3-01	DO YOU WORK WITH TRANSISTOR AMPLIFIERS IN YOUR PRESENT JOB	86	86	90	84	90	
G 429	G3-02	DO YOU INSPECT TRANSISTOR AMPLIFIERS	87	87	85	86	90	
G 430	G3-03	DO YOU ALIGN OR ADJUST TRANSISTOR AMPLIFIERS	81	82	75	79	90	TRANSISTOR AMPLIFIERS
G 431	G3-04	DO YOU TROUBLESHOOT TO THE AMPLIFIER CIRCUIT LEVEL	86	86	85	84	90	
G 432	G3-05	DO YOU TROUBLESHOOT TO AMPLIFIER COMPONENTS	86	86	90	84	90	
G 433	G3-06	DO YOU REMOVE OR REPLACE THE COMPLETE AMPLIFIER	74	75	70	74	85	
G 434	G3-07	DO YOU REMOVE OR REPLACE AMPLIFIER COMPONENTS	84	83	90	84	90	
G 435	G3-08	DO YOU USE OR REFER TO (COMMON EMITTER) THE CHANGE IN COLLECTOR CURRENT WHICH RESULTS FROM A CHANGE IN BASE CURRENT	48	48	50	51	40	
G 436	G3-09	DO YOU USE OR REFER TO (COMMON EMITTER) THE CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN COLLECTOR CURRENT WHICH RESULTS FROM A SPECIFIC CHANGE IN BASE CURRENT	30	31	20	32	15	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155
G 437	G3-10	DO YOU USE OR REFER TO (COMMON EMITTER) THE CHANGE IN COLLECTOR VOLTAGE WHICH RESULTS FROM A CHANGE IN BASE CURRENT	49	50	40	51	45
G 438	G3-11	DO YOU USE OR REFER TO (COMMON EMITTER) THE CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN COLLECTOR VOLTAGE WHICH RESULTS FROM A SPECIFIC CHANGE IN BASE CURRENT	27	28	20	28	15
G 439	G3-12	DO YOU USE OR REFER TO (COMMON EMITTER) THE CHANGE IN BASE CURRENT WHICH RESULTS FROM AN INPUT SIGNAL	47	48	40	47	50
G 440	G3-13	DO YOU USE OR REFER TO (COMMON EMITTER) THE CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN BASE CURRENT WHICH RESULTS FROM A SPECIFIC INPUT SIGNAL	29	30	20	31	20
G 441	G3-14	DO YOU USE THE LOAD-LINE METHOD OF ANALYSIS IN YOUR CIRCUIT ANALYSIS (THIS METHOD REQUIRES YOU TO PLOT A LOAD-LINE ON A TRANSISTOR CHARACTERISTIC CURVE)	12	12	10	11	5
G 442	G3-15	DO YOU USE OR REFER TO THE OPERATING POINT Q (QUIESCENT POINT) FOR A TRANSISTOR	25	26	10	24	20
G 443	G3-16	DO YOU CALCULATE THE SPECIFIC QUIESCENT POINT FOR A PARTICULAR TRANSISTOR	14	14	15	12	5
G 444	G3-17	DO YOU MEASURE VOLTAGE GAIN USED IN THE COMMON EMITTER CONFIGURATION	62	63	50	64	60
G 445	G3-18	DO YOU MEASURE CURRENT GAIN USED IN THE COMMON EMITTER CONFIGURATION	45	46	30	46	50
G 446	G3-19	DO YOU MEASURE POWER GAIN USED IN THE COMMON EMITTER CONFIGURATION	40	42	25	41	40
G 447	G3-20	DO YOU CALCULATE THE VOLTAGE GAIN FOR SPECIFIC TRANSISTORS USING A FORMULA THAT IS, DO YOU DIVIDE THE CHANGE IN BASE-EMITTER VOLTAGE INTO THE CHANGE THE BASE COLLECTOR VOLTAGE TO DETERMINE THE VOLTAGE GAIN	18	18	10	18	5
G 448	G3-21	DO YOU CALCULATE THE CURRENT GAIN FOR SPECIFIC TRANSISTORS USING A FORMULA THAT IS, DO YOU DIVIDE THE CHANGE IN BASE CURRENT INTO THE CHANGE IN COLLECTOR CURRENT TO DETERMINE THE CURRENT GAIN	16	17	10	17	5
G 449	G3-22	DO YOU CALCULATE THE POWER GAIN FOR A SPECIFIC TRANSISTOR USING A FORMULA THAT IS, DO YOU MULTIPLY THE CURRENT GAIN TIMES THE VOLTAGE GAIN TO DETERMINE THE POWER GAIN	13	14	10	14	10
G 450	G3-23	DO YOU NEED TO KNOW THAT MORE COLLECTOR CURRENT IS GENERATED WITH LESS COLLECTOR VOLTAGE AS TEMPERATURE INCREASES (THIS AFFECTS THE STATIC OPERATING POINT EQ) OF THE TRANSISTOR)	23	23	25	22	30
G 451	G3-24	DO YOU COMPUTE THE STATIC OPERATING POINT EQ) OF A TRANSISTOR AT DIFFERENT TEMPERATURES	11	10	15	9	15
G 452	G3-25	DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH EMITTER (SWAMPING) RESISTOR STABILIZATION	51	52	40	51	35
G 453	G3-26	DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSUCIATED WITH SELF-BIAS STABILIZATION	50	50	45	49	40

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155
G 454	G3-27 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH THERMISTOR STABILIZATION	52	53	45	51	50
G 455	G3-28 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH FORWARD BIAS DIODE STABILIZATION	52	52	45	53	40
G 456	G3-29 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH REVERSE BIAS DIODE STABILIZATION	51	51	45	51	40
G 457	G3-30 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH DOUBLE DIODE STABILIZATION	41	41	40	41	35
G 458	G3-31 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM EMITTER (SWAMPING) RESISTOR STABILIZATION	52	54	35	54	45
G 459	G3-32 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM SELF-BIAS STABILIZATION	52	53	40	52	50
G 460	G3-33 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM THERMISTOR STABILIZATION	52	53	45	53	55
G 461	G3-34 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM FORWARD BIAS DIODE STABILIZATION	52	52	45	53	50
G 462	G3-35 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM REVERSE BIAS DIODE STABILIZATION	51	52	45	53	50
G 463	G3-36 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM DOUBLE DIODE STABILIZATION	41	42	30	41	45
G 464	G3-37 DO YOU IDENTIFY AMPLITUDE DISTORTION FOR TRANSISTOR CIRCUITS	56	57	40	55	70
G 465	G3-38 DO YOU TROUBLESHOOT TRANSISTOR CIRCUITS TO FIND THE CAUSES OF AMPLITUDE DISTORTION	68	68	65	66	75
G 466	G3-39 DO YOU IDENTIFY FREQUENCY DISTORTION FOR TRANSISTOR CIRCUITS	61	62	50	61	70
G 467	G3-40 DO YOU IDENTIFY PHASE DISTORTION FOR TRANSISTOR CIRCUITS	49	51	30	49	55
G 468	G3-41 DO YOU TROUBLESHOOT TRANSISTOR CIRCUITS TO FIND THE CAUSES OF PHASE DISTORTION	48	49	35	48	55
G 469	G3-42 DO YOU TROUBLESHOOT TRANSISTOR CIRCUITS TO FIND THE CAUSES OF FREQUENCY DISTORTION	59	59	55	59	70
G 470	G3-43 DO YOU NEED TO KNOW THE DEGENERATIVE EFFECTS ON THE CIRCUIT CAUSED BY CHANGING EMITTER RESISTANCE FOR TRANSISTOR AMPLIFIERS IN THE COMMON COLLECTOR CONFIGURATION	37	37	40	36	35
G 471	G3-44 DO YOU DETERMINE THE CLASS OF OPERATION FOR AMPLIFIERS IN ORDER TO TROUBLESHOOT AMPLIFIER CIRCUITS	47	47	45	48	50
G 472	G3-45 DO YOU TROUBLESHOOT OR REPAIR PARAPHASE AMPLIFIERS	38	38	35	41	20
G 473	G3-46 DO YOU TROUBLESHOOT OR REPAIR PUSH-PULL AMPLIFIERS	76	76	80	75	80
G 474	G3-47 DO YOU TROUBLESHOOT OR REPAIR COMPLEMENTARY SYMMETRY CIRCUITS	58	57	60	55	65
G 475	G3-48 DO YOU TROUBLESHOOT OR REPAIR COMPOUND-CONNECTED AMPLIFIERS	52	51	60	52	55

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

			BY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
G	476	G3-49	DO YOU TROUBLESHOOT OR REPAIR CASCADE-CONNECTED AMPLIFIERS	67	67	60	66	80	
H	477	H1-01	DO YOU USE OR REFER TO VARACTORS	44	45	35	47	35	
H	478	H1-02	DO YOU USE OR REFER TO TUNNEL DIODES	36	37	25	39	30	SOLID-STATE SPECIAL PURPOSE DEVICES
H	479	H1-03	DO YOU USE OR REFER TO FIELD EFFECT TRANSISTORS (FET)	60	60	65	57	60	
H	480	H1-04	DO YOU USE OR REFER TO UNIJUNCTION TRANSISTORS	58	58	60	57	70	
H	481	H1-05	DO YOU USE OR REFER TO ZENER DIODES	92	92	95	89	100	
H	482	H1-06	DO YOU USE OR REFER TO INTEGRATED CIRCUITS	88	87	95	84	90	
H	483	H2-01	IN YOUR PRESENT JOB, DO YOU WORK WITH POWER SUPPLIES	88	87	90	86	95	
H	484	H2-02	DO YOU INSPECT POWER SUPPLIES	87	88	80	88	95	
H	485	H2-03	DO YOU CLEAN POWER SUPPLIES	84	84	80	86	90	
H	486	H2-04	DO YOU ALIGN OR ADJUST POWER SUPPLIES	85	85	85	84	90	POWER SUPPLIES
H	487	H2-05	DO YOU TROUBLESHOOT TO POWER SUPPLY CIRCUIT LEVEL	87	87	90	87	90	
H	488	H2-06	DO YOU TROUBLESHOOT TO POWER SUPPLY COMPONENTS	88	87	90	87	90	
H	489	H2-07	DO YOU REMOVE OR REPLACE COMPLETE POWER SUPPLIES	77	77	75	78	85	
H	490	H2-08	DO YOU REMOVE OR REPLACE POWER SUPPLY COMPONENTS	86	86	90	87	90	
H	491	H2-09	DO YOU WORK WITH HALF-WAVE RECTIFIERS	77	77	85	76	70	
H	492	H2-10	DO YOU WORK WITH FULL-WAVE RECTIFIERS OTHER THAN BRIDGE RECTIFIERS	81	81	85	80	85	
H	493	H2-11	DO YOU WORK WITH BRIDGE RECTIFIERS	87	88	80	86	90	
H	494	H2-12	DO YOU WORK WITH THREE-PHASE RECTIFIERS	28	29	25	28	25	
H	495	H2-13	DO YOU USE OR REFER TO INPUT VOLTAGE	87	87	90	85	90	
H	496	H2-14	DO YOU USE OR REFER TO INPUT FREQUENCY	62	64	45	62	55	
H	497	H2-15	DO YOU USE OR REFER TO PEAK OUTPUT VOLTAGE	78	79	70	80	70	
H	498	H2-16	DO YOU USE OR REFER TO AVERAGE OUTPUT VOLTAGE	77	76	85	76	70	
H	499	H2-17	DO YOU USE OR REFER TO RIPPLE AMPLITUDE	73	73	65	74	70	
H	500	H2-18	DO YOU USE OR REFER TO RIPPLE FREQUENCY	70	72	55	71	70	
H	501	H2-19	DO YOU USE OR REFER TO PEAK REVERSE (INVERSE) VOLTAGE	54	55	45	53	55	
H	502	H2-20	DO YOU USE OR REFER TO SHAPE OF OUTPUT WAVEFORMS	76	77	65	74	85	
H	503	H2-21	DO YOU USE OR REFER TO EFFECTIVE OUTPUT VOLTAGE	77	77	75	78	80	
H	504	H2-22	DO YOU WORK WITH CIRCUITS WHICH EMPLOY CAPACITIVE FILTERS	82	83	80	82	85	
H	505	H2-23	DO YOU WORK WITH CIRCUITS WHICH EMPLOY INDUCTIVE FILTERS	74	75	65	74	65	
H	506	H2-24	DO YOU WORK WITH CIRCUITS WHICH EMPLOY CAPACITIVE INPUT L-TYPE FILTERS	65	66	50	66	75	
H	507	H2-25	DO YOU WORK WITH CIRCUITS WHICH EMPLOY INDUCTIVE INPUT L-TYPE FILTERS	61	63	45	63	60	
H	508	H2-26	DO YOU WORK WITH CIRCUITS WHICH EMPLOY LC PI-TYPE FILTERS	60	61	50	60	55	
H	509	H2-27	DO YOU WORK WITH CIRCUITS WHICH EMPLOY RC PI-TYPE FILTERS	62	63	50	63	60	
H	510	H2-28	DO YOU WORK WITH CIRCUITS WHICH EMPLOY DON'T REMEMBER WHICH TYPE OF FILTER	21	21	25	19	25	
H	511	H2-29	DO YOU HAVE THE OPTION OF REPLACING ONE TYPE OF FILTER WITH A DIFFERENT TYPE FILTER	13	13	10	13	15	
H	512	H3-01	DO YOU WORK WITH OSCILLATORS IN YOUR PRESENT JOB	85	84	90	80	80	OSCILLATORS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
H 513	H3-02	DO YOU INSPECT OSCILLATORS	81	81	75	82	85	
H 514	H3-03	DO YOU ALIGN OR ADJUST OSCILLATORS	80	79	95	78	75	
H 515	H3-04	DO YOU REMOVE OR REPLACE COMPLETE OSCILLATORS	64	64	60	65	60	
H 516	H3-05	DO YOU REMOVE OR REPLACE OSCILLATOR COMPONENTS	78	77	85	79	80	
H 517	H3-06	DO YOU TROUBLESHOOT TO OSCILLATOR CIRCUIT LEVEL	81	80	90	79	80	
H 518	H3-07	DO YOU TROUBLESHOOT TO OSCILLATOR COMPONENTS	80	79	90	78	80	
H 519	H3-08	DO YOU USE OR REFER TO FEEDBACK	77	77	75	74	80	
H 520	H3-09	DO YOU USE OR REFER TO FREQUENCY DETERMINING DEVICES (FDD)	60	61	55	59	50	
H 521	H3-10	DO YOU USE OR REFER TO AMPLITUDE STABILITY	58	59	50	59	50	
H 522	H3-11	DO YOU USE OR REFER TO FREQUENCY STABILITY	70	72	45	70	65	
H 523	H3-12	DO YOU USE OR REFER TO DAMPING	61	60	65	62	40	
H 524	H3-13	DO YOU USE OR REFER TO REGENERATIVE FEEDBACK	75	75	70	72	80	
H 525	H3-14	DO YOU USE OR REFER TO PIEZOELECTRIC EFFECT	33	34	25	34	25	
H 526	H3-15	DO YOU USE OR REFER TO CRITICAL DAMPING	31	32	25	34	10	
H 527	H3-16	DO YOU USE OR REFER TO UNDER DAMPING	31	32	20	35	10	
H 528	H3-17	DO YOU USE OR REFER TO OVER DAMPING	31	32	20	34	10	
H 529	H3-18	DO YOU WORK WITH OSCILLATORS WHICH USE LC TANK CIRCUITS AS FDD	64	64	60	63	65	
H 530	H3-19	DO YOU WORK WITH OSCILLATORS WHICH USE RC NETWORKS AS FDD	72	73	55	71	75	
H 531	H3-20	DO YOU WORK WITH OSCILLATORS WHICH USE CRYSTALS AS FDD	74	76	55	72	80	
H 532	H3-21	DO YOU WORK WITH OSCILLATORS WHICH USE DON'T REMEMBER WHICH TYPE OF FDD	13	12	20	13	0	
H 533	H3-22	DO YOU WORK WITH SERIES HARTLEY SINUSOIDAL OSCILLATORS	50	52	35	49	55	
H 534	H3-23	DO YOU WORK WITH SHUNT HARTLEY SINUSOIDAL OSCILLATORS	48	50	30	48	45	
H 535	H3-24	DO YOU WORK WITH COLPITTS SINUSOIDAL OSCILLATORS	52	54	35	52	50	
H 536	H3-25	DO YOU WORK WITH CLAPP SINUSOIDAL OSCILLATORS	14	16	10	13	20	
H 537	H3-26	DO YOU WORK WITH BUTLER SINUSOIDAL OSCILLATORS	16	17	5	16	15	
H 538	H3-27	DO YOU WORK WITH DON'T REMEMBER WHICH TYPE OF OSCILLATORS	27	25	45	23	30	
I 539	I1-01	DO YOU WORK WITH MULTIVIBRATORS IN YOUR PRESENT JOB	75	76	70	73	70	
I 540	I1-02	DO YOU INSPECT WAVE GENERATING OR SHAPING CIRCUITS	70	70	60	71	75	
I 541	I1-03	DO YOU ALIGN OR ADJUST WAVE GENERATING OR SHAPING CIRCUITS	65	67	45	68	65	MULTIVIBRATORS
I 542	I1-04	DO YOU CALIBRATE WAVE GENERATING OR SHAPING CIRCUITS	54	56	30	57	50	
I 543	I1-05	DO YOU TROUBLESHOOT TO WAVE GENERATING OR SHAPING CIRCUITS	68	69	50	69	65	
I 544	I1-06	DO YOU TROUBLESHOOT TO WAVE GENERATING OR SHAPING CIRCUIT COMPONENTS	68	69	60	68	70	
I 545	I1-07	DO YOU REMOVE OR REPLACE COMPLETE WAVE GENERATING OR SHAPING CIRCUITS	50	51	35	52	60	
I 546	I1-08	DO YOU REMOVE OR REPLACE WAVE GENERATING OR SHAPING COMPONENTS	66	66	60	67	65	
I 547	I1-09	DO YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN LC TANK CIRCUITS	63	64	50	63	65	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
I 548	11-10 DO YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN RC NETWORKS	67	69	50	67	70	
I 549	11-11 DO YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN CRYSTALS	57	58	45	60	50	
I 550	11-12 DO YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN DON'T REMEMBER WHICH TYPE OF FDD	16	15	20	15	10	
I 551	11-13 DO YOU WORK WITH ASTABLE MULTIVIBRATORS	61	64	35	65	55	
I 552	11-14 DO YOU WORK WITH MONOSTABLE MULTIVIBRATORS	63	65	45	64	60	
I 553	11-15 DO YOU WORK WITH BISTABLE MULTIVIBRATORS	63	66	35	66	55	
I 554	11-16 DO YOU WORK WITH DON'T REMEMBER WHICH TYPE MULTIVIBRATORS	14	13	25	11	15	
I 555	12-01 DO YOU WORK WITH LIMITERS OR CLAMPERS IN YOUR PRESENT JOB	79	78	85	77	80	
I 556	12-02 DO YOU WORK WITH SERIES DIODE LIMITERS	55	56	45	54	55	LIMITERS AND CLAMPERS
I 557	12-03 DO YOU WORK WITH SHUNT DIODE LIMITERS	51	53	35	51	55	
I 558	12-04 DO YOU WORK WITH LIMITERS WITH BIAS	48	49	45	48	35	
I 559	12-05 DO YOU WORK WITH ZENER DIODE LIMITERS	60	60	55	57	70	
I 560	12-06 DO YOU WORK WITH TRANSISTOR LIMITERS	59	60	55	57	65	
I 561	12-07 DO YOU WORK WITH DON'T KNOW WHICH TYPE OF LIMITERS	17	16	25	18	10	
I 562	12-08 DO YOU WORK WITH BASIC DIODE CLAMPING CIRCUITS	64	65	50	62	65	
I 563	12-09 DO YOU WORK WITH DIODE CLAMPING CIRCUITS WITH BIAS	60	62	45	61	60	
I 564	12-10 DO YOU WORK WITH DON'T KNOW WHICH TYPE OF CLAMPING CIRCUIT	19	18	25	20	20	
I 565	13-01 IN YOUR PRESENT JOB, DO YOU WORK ON EQUIPMENT WHICH CONTAINS ELECTRON TUBES	87	87	85	89	95	
I 566	13-02 DO YOU CHECK ELECTRON TUBES TO SEE IF THEY ARE GOOD	86	87	75	89	95	
I 567	13-03 DO YOU USE TUBE TESTERS TO CHECK ELECTRON TUBES	85	86	70	89	95	ELECTRON TUBES
I 568	13-04 DO YOU USE MULTIMETERS TO CHECK ELECTRON TUBES	62	62	60	64	55	
I 569	13-05 DO YOU USE SCOPES TO CHECK ELECTRON TUBES	61	61	55	64	65	
I 570	13-06 DO YOU USE SUBSTITUTION TO CHECK ELECTRON TUBES	85	85	80	86	90	
I 571	13-07 DO YOU USE OR REFER TO CUTOFF	56	57	50	59	60	
I 572	13-08 DO YOU USE OR REFER TO PEAK INVERSE VOLTAGE RATING	33	34	15	34	30	
I 573	13-09 DO YOU USE OR REFER TO PEAK CURRENT RATING	35	37	20	35	35	
I 574	13-10 DO YOU USE OR REFER TO TRANSIT TIME	27	28	10	29	20	
I 575	13-11 DO YOU USE OR REFER TO PLATE DISSIPATION RATING	30	31	20	32	35	
I 576	13-12 DO YOU USE OR REFER TO SATURATION	55	56	50	59	60	
I 577	13-13 DO YOU USE OR REFER TO DC PLATE RESISTANCE	41	42	30	41	50	
I 578	13-14 DO YOU COMPUTE ACTUAL VALUES OF THE DC PLATE RESISTANCE FOR ELECTRON TUBES	16	16	10	18	20	
I 579	13-15 DO YOU USE OR REFER TO PLATE VOLTAGE	83	83	80	84	85	
I 580	13-16 DO YOU USE OR REFER TO PLATE CURRENT	65	66	50	67	70	
I 581	13-17 DO YOU USE OR REFER TO GRID VOLTAGE	81	82	75	84	80	
I 582	13-18 DO YOU USE OR REFER TO GRID CURRENT	64	65	50	66	65	
I 583	13-19 DO YOU USE OR REFER TO CATHODE VOLTAGE	81	82	75	84	80	
I 584	13-20 DO YOU USE OR REFER TO CATHODE CURRENT	65	66	55	67	70	
I 585	13-21 DO YOU USE OR REFER TO THE TRIODE AMPLIFICATION FACTOR (THE AMPLIFICATION FACTOR FOR TRIODES IS DEFINED AS THE RATIO OF CHANGE IN PLATE VOLTAGE TO A CHANGE IN GRID VOLTAGE)	26	26	20	26	15	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
I	586	I3-22 DO YOU CALCULATE ACTUAL VALUES OF TRIODE AMPLIFICATION FACTORS	12	13	5	13	10	
I	587	I3-23 DO YOU USE OR REFER TO MULTIGRID (TETRODE, PENTODE, ETC) AMPLIFICATION FACTORS	24	24	15	26	20	
I	588	I3-24 DO YOU USE OR REFER TO ELECTRON TUBE TRANSCONDUCTANCE (G, WHICH IS MEASURED IN MHOS)	18	19	10	20	15	
I	589	I3-25 DO YOU CALCULATE ACTUAL VALUES OF ELECTRON TUBE TRANSCONDUCTANCES	11	12	5	13	10	
I	590	I3-26 DO YOU USE OR REFER TO THE ELECTRON TUBE PARAMETER CALLED AC PLATE RESISTANCE	15	16	5	18	15	
I	591	I3-27 DO YOU CALCULATE ACTUAL VALUES OF AC PLATE RESISTANCE	12	14	0	14	10	
I	592	I3-28 DO YOU USE OR REFER TO ELECTRON TUBE INTERELECTRODE CAPACITANCE	28	30	10	30	25	
I	593	I3-29 DO YOU USE OR REFER TO CHARACTERISTIC CURVES IN YOUR WORK WITH ELECTRON TUBES	20	20	15	21	20	
I	594	I3-30 DO YOU USE CHARACTERISTIC CURVES TO SELECT PLATE VOLTAGE FOR A SPECIFIED BIAS	18	19	10	20	10	
I	595	I3-31 DO YOU USE CHARACTERISTIC CURVES TO SELECT PLATE CURRENT FOR A SPECIFIED BIAS	17	18	5	20	10	
I	596	I3-32 DO YOU USE CHARACTERISTIC CURVES TO SELECT BIAS REQUIRED FOR CUTOFF	21	22	10	24	10	
I	597	I3-33 DO YOU USE CHARACTERISTIC CURVES TO SELECT BIAS REQUIRED FOR SATURATION	21	23	10	26	10	
I	598	I3-34 DO YOU USE OR REFER TO ELECTRON TUBE AMPLIFIER GAIN	58	60	30	58	60	
I	599	I3-35 DO YOU USE OR REFER TO ELECTRON TUBE AMPLIFIER EFFICIENCY	38	39	25	38	55	
I	600	I3-36 DO YOU USE TEST TUBE CHECKERS TO DETERMINE ELECTRON TUBE AMPLIFIER GAIN	59	61	45	63	65	
I	601	I3-37 DO YOU USE MULTIMETERS TO DETERMINE ELECTRON TUBE AMPLIFIER GAIN	45	46	35	45	45	
I	602	I3-38 DO YOU USE OSCILLOSCOPES TO DETERMINE ELECTRON TUBE AMPLIFIER GAIN	56	57	50	59	55	
I	603	I3-39 DO YOU USE CHARACTERISTIC CURVES TO DETENMINE ELECTRON TUBE AMPLIFIER GAIN	20	20	15	21	15	
I	604	I3-40 DO YOU CALCULATE ANY ELECTRON TUBE CAPACITANCES SUCH AS INPUT CAPACITANCE	11	11	10	13	5	
I	605	I3-41 DO YOU USE OR REFER TO TUBE SOCKET NOTATION	79	79	75	78	80	
I	606	I3-42 DO YOU USE OR REFER TO PIN NUMBERING SYSTEMS	83	84	75	85	85	
I	607	I3-43 DO YOU USE OR REFER TO THE TYPE OF MATERIAL OR THE OPERATING TEMPERATURE OF THE EMITTING SURFACE IN THE ELECTRON TUBES YOU WORK ON	17	16	25	18	10	
I	608	I3-44 DO YOU USE OR REFER TO TUBE SUBSTITUTION MATERIAL SUCH AS MANUALS OR CHARTS	76	77	70	80	75	
J	609	J1-01 DO YOU WORK WITH ELECTRON TUBE AMPLIFIERS OR CIRCUITS IN YOUR PRESENT JOB	79	80	65	84	75	
J	610	J1-02 DO YOU DETERMINE THE CLASS OF OPERATION FOR ELECTRON TUBE AMPLIFIERS IN ORDER TO TROUBLESHOOT AMPLIFIER CIRCUITS	40	40	40	43	40	ELECTRON TUBE AMPLIFIERS AND CIRCUITS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
J 611	J1-03	DO YOU TROUBLESHOOT OR REPAIR PARAPHASE AMPLIFIERS	34	36	20	39	25	
J 612	J1-04	DO YOU TROUBLESHOOT OR REPAIR PUSH-PULL AMPLIFIERS	61	61	60	66	65	
J 613	J1-05	DO YOU TROUBLESHOOT OR REPAIR COMPOUND-CONNECTED AMPLIFIERS	41	41	35	43	45	
J 614	J1-06	DO YOU TROUBLESHOOT OR REPAIR CASCADE-CONNECTED AMPLIFIERS	53	54	40	56	55	
J 615	J1-07	DO YOU TROUBLESHOOT OR REPAIR DON'T KNOW WHICH TYPE OF AMPLIFIER	23	23	25	27	15	
J 616	J2-01	DO YOU WORK WITH GAS TUBES (HOT CATHODE OR COLD CATHODE)	65	66	50	70	70	
J 617	J2-02	DO YOU WORK WITH CATHODE-RAY TUBES	86	86	85	88	85	SPECIAL PURPOSE ELECTRON TUBES
J 618	J2-03	DO YOU USE OR REFER TO THE CHARACTERISTICS OF BEAM POWER TUBES	22	23	10	24	15	
J 619	J2-04	DO YOU TROUBLESHOOT OR REPAIR CIRCUITS IN WHICH BEAM POWER TUBES ARE USED	31	33	15	34	30	
J 620	J2-05	DO YOU USE OR REFER TO THE CHARACTERISTICS OF THYRATRONS	11	12	0	13	10	
J 621	J2-06	DO YOU TROUBLESHOOT OR REPAIR CIRCUITS IN WHICH THYRATRONS ARE USED	11	12	0	13	15	
J 622	J2-07	DO YOU USE OR REFER TO THE PRINCIPLES OF OPERATION OF ELECTRON GUNS OF CATHODE-RAY TUBES (CRT)	82	83	75	86	70	
J 623	J2-08	DO YOU USE OR REFER TO THE PRINCIPLES OF OPERATION OF ELECTROMAGNETIC DEFLECTION SYSTEMS OF CATHODE-RAY TUBES (CRT)	82	83	75	85	75	
J 624	J2-09	DO YOU USE OR REFER TO THE PRINCIPLES OF OPERATION OF ELECTROSTATIC DEFLECTION SYSTEMS OF CATHODE-RAY TUBES (CRT)	73	75	60	74	75	
J 625	J2-10	DO YOU USE OR REFER TO PHOSPHOR SCREENS	77	78	65	82	70	
J 626	J2-11	DO YOU USE OR REFER TO AQUADAG COATINGS	76	77	65	80	70	
J 627	J2-12	DO YOU USE OR REFER TO ELECTRON OPTICS	45	46	35	48	45	
J 628	J2-13	DO YOU USE OR REFER TO PERSISTENCE	48	48	50	50	45	
J 629	J2-14	DO YOU USE OR REFER TO DECAY TIMES	37	38	30	39	30	
J 630	J2-15	DO YOU USE OR REFER TO FLUORESCENCE	49	51	30	53	45	
J 631	J2-16	DO YOU USE OR REFER TO PHOSPHORESCENCE	56	58	40	60	50	
J 632	J3-01	DO YOU WORK ON TRANSMIT OR RECEIVE SYSTEMS IN YOUR PRESENT JOB	44	44	50	40	50	
J 633	J3-02	DO YOU PERFORM TASKS ON FREQUENCY CONVERTERS	33	32	40	26	40	
J 634	J3-03	DO YOU PERFORM TASKS ON FREQUENCY MIXERS	33	33	40	28	35	
J 635	J3-04	DO YOU USE OR REFER TO THE HETERODYNING OF SIGNALS IN YOUR WORK WITH TRANSMIT OR RECEIVE SYSTEMS	34	34	40	29	35	HETERODYNING, MODULATION, AND DEMODULATION
J 636	J3-05	DO YOU PERFORM TASKS ON REACTANCE MODULATORS	18	18	20	15	25	
J 637	J3-06	DO YOU PERFORM TASKS ON MODULATED OSCILLATORS	27	26	40	22	25	
K 638	K1-01	DO YOU WORK ON AM TRANSMIT OR RECEIVE SYSTEMS IN YOUR PRESENT JOB	34	35	30	33	30	
K 639	K1-02	DO YOU INSPECT AM TRANSMIT OR RECEIVE SYSTEMS	33	33	30	30	25	
K 640	K1-03	DO YOU CLEAN AM TRANSMIT OR RECEIVE SYSTEMS	30	31	30	30	25	
K 641	K1-04	DO YOU ALIGN OR ADJUST AM TRANSMIT OR RECEIVE SYSTEMS	32	32	30	30	25	AM SYSTEMS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
K 642	K1-05 DO YOU TROUBLESHOOT TO AM TRANSMIT OR RECEIVE SYSTEMS	32	32	30	29	25	
K 643	K1-06 DO YOU TROUBLESHOOT TO AM TRANSMIT OR RECEIVE COMPONENTS	32	32	30	30	25	
K 644	K1-07 DO YOU REMOVE OR REPLACE AM TRANSMIT OR RECEIVE SYSTEMS	27	27	30	26	25	
K 645	K1-08 DO YOU REMOVE OR REPLACE AM TRANSMIT OR RECEIVE COMPONENTS	30	30	30	29	25	
K 646	K1-09 DO YOU PERFORM TASKS ON RF OSCILLATORS	32	33	25	29	30	
K 647	K1-10 DO YOU PERFORM TASKS ON RF AMPLIFIERS	33	34	25	30	30	
K 648	K1-11 DO YOU PERFORM TASKS ON AUDIO AMPLIFIERS	36	36	30	34	30	
K 649	K1-12 DO YOU PERFORM TASKS ON POWER AMPLIFIERS	32	32	30	30	25	
K 650	K1-13 DO YOU PERFORM TASKS ON LOCAL OSCILLATORS	34	34	30	32	30	
K 651	K1-14 DO YOU PERFORM TASKS ON IF AMPLIFIERS	33	33	30	30	30	
K 652	K1-15 DO YOU PERFORM TASKS ON DETECTORS	33	33	30	30	30	
K 653	K1-16 DO YOU PERFORM TASKS ON DON'T REMEMBER WHICH AM STAGE	6	7	5	7	0	
K 654	K1-17 DO YOU USE OR REFER TO AMPLITUDE STABILIZATION IN TRANSMITTERS	16	16	10	16	15	
K 655	K1-18 DO YOU USE OR REFER TO FREQUENCY STABILIZATION IN TRANSMITTERS	16	16	15	16	15	
K 656	K1-19 DO YOU USE OR REFER TO SENSITIVITY OF RECEIVERS	28	29	20	26	25	
K 657	K1-20 DO YOU USE OR REFER TO SELECTIVITY OF RECEIVERS	29	30	20	26	25	
K 658	K1-21 DO YOU USE OR REFER TO 2ND HARMONIC DISTORTION	16	16	15	14	20	
K 659	K1-22 DO YOU USE OR REFER TO BANDPASS DISTORTION	25	25	20	22	20	
K 660	K1-23 DO YOU USE OR REFER TO SQUARE LAW DISTORTION	9	9	0	8	15	
K 661	K1-24 DO YOU USE OR REFER TO CO-CHANNEL INTERFERENCE	26	27	15	24	25	
K 662	K1-25 DO YOU USE OR REFER TO IMAGE FREQUENCIES IN RECEIVERS	24	25	10	25	20	
K 663	K1-26 DO YOU USE OR REFER TO SIGNAL TO IMAGE RATIOS OR IMAGE REJECTION RATIOS	17	18	5	16	20	
K 664	K1-27 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH AM TRANSMITTER SCHEMATIC DIAGRAMS	21	21	20	19	30	
K 665	K1-28 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH AM RECEIVER SCHEMATIC DIAGRAMS	33	34	25	31	30	
K 666	K2-01 DO YOU WORK WITH FM TRANSMIT OR RECEIVE SYSTEMS IN YOUR PRESENT JOB	33	33	35	32	30	
K 667	K2-02 DO YOU INSPECT FM TRANSMIT OR RECEIVE SYSTEMS	33	33	35	32	30	
K 668	K2-03 DO YOU CLEAN FM TRANSMIT OR RECEIVE SYSTEMS	32	32	35	32	30	
K 669	K2-04 DO YOU ALIGN FM TRANSMIT OR RECEIVE SYSTEMS	31	31	35	30	30	FM SYSTEMS
K 670	K2-05 DO YOU TROUBLESHOOT TO FM TRANSMIT OR RECEIVE SYSTEMS	32	31	35	30	30	
K 671	K2-06 DO YOU TROUBLESHOOT TO FM TRANSMIT OR RECEIVE COMPONENTS	32	31	35	31	25	
K 672	K2-07 DO YOU REMOVE OR REPLACE FM TRANSMIT OR RECEIVE SYSTEMS	24	23	30	24	25	
K 673	K2-08 DO YOU REMOVE OR REPLACE FM TRANSMIT OR RECEIVE COMPONENTS	30	30	35	30	25	
K 674	K2-09 DO YOU PERFORM TASKS ON AUDIO AMPLIFIERS	34	34	35	32	30	
K 675	K2-10 DO YOU PERFORM TASKS ON FREQUENCY MULTIPLIERS	27	26	30	26	25	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
K 676	K2-11	DO YOU PERFORM TASKS ON DRIVERS (INTERMEDIATE AMPLIFIERS)	31	31	35	29	25	
K 677	K2-12	DO YOU PERFORM TASKS ON POWER AMPLIFIERS	30	29	35	27	25	
K 678	K2-13	DO YOU PERFORM TASKS ON RF AMPLIFIERS	30	31	30	28	30	
K 679	K2-14	DO YOU PERFORM TASKS ON FREQUENCY CONVERTERS	30	29	35	26	25	
K 680	K2-15	DO YOU PERFORM TASKS ON IF AMPLIFIERS	32	32	35	30	30	
K 681	K2-16	DO YOU PERFORM TASKS ON LIMITERS	31	31	35	29	25	
K 682	K2-17	DO YOU PERFORM TASKS ON FREQUENCY DISCRIMINATORS	30	31	30	28	25	
K 683	K2-18	DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH SCHEMATIC DIAGRAMS OF FM TRANSMITTERS	20	19	25	18	25	
K 684	K2-19	DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH SCHEMATIC DIAGRAMS OF FM RECEIVERS	32	31	35	30	25	
K 685	K3-01	DO YOU CONVERT DECIMAL (BASE 10) NUMBERS TO OCTAL (BASE 8) NUMBERS	10	10	5	11	5	
K 686	K3-02	DO YOU CONVERT DECIMAL NUMBERS TO BINARY (BASE 2) NUMBERS	16	16	10	16	5	NUMBERING SYSTEMS
K 687	K3-03	DO YOU CONVERT OCTAL NUMBERS TO DECIMAL NUMBERS	8	8	5	7	5	
K 688	K3-04	DO YOU CONVERT OCTAL NUMBERS TO BINARY NUMBERS	7	7	5	6	5	
K 689	K3-05	DO YOU CONVERT BINARY NUMBERS TO DECIMAL NUMBERS	12	12	10	11	5	
K 690	K3-06	DO YOU CONVERT BINARY NUMBERS TO OCTAL NUMBERS	7	7	5	6	5	
K 691	K3-07	DO YOU ADD BINARY NUMBERS TO GET A SUM	12	12	15	11	5	
K 692	K3-08	DO YOU SUBTRACT BINARY NUMBERS USING THE END-AROUND-CARRY METHOD	9	10	5	10	5	
K 693	K3-09	DO YOU SUBTRACT BINARY NUMBERS USING THE DIRECT SUBTRACTION METHOD	11	12	0	13	5	
K 694	K3-10	DO YOU ADD OCTAL NUMBERS TO GET A SUM	8	8	5	9	5	
L 695	L1-01	IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS RELATING TO LOGIC FUNCTIONS	29	27	45	26	30	
L 696	L1-02	DO YOU CONSTRUCT TRUTH TABLES FOR AND LOGIC SYMBOLS OR GATES	18	17	25	16	10	
L 697	L1-03	DO YOU CONSTRUCT TRUTH TABLES FOR OR LOGIC SYMBOLS OR GATES	17	16	20	16	10	LOGIC FUNCTIONS
L 698	L1-04	DO YOU CONSTRUCT TRUTH TABLES FOR AND OR OR LOGIC SYMBOLS WITH STATE INDICATORS	17	16	25	15	10	
L 699	L1-05	DO YOU CONSTRUCT TRUTH TABLES FOR EXCLUSIVE OR LOGIC SYMBOLS OR GATES	16	16	20	16	5	
L 700	L1-06	DO YOU USE OR REFER TO TRUTH TABLES FOR AND LOGIC SYMBOLS OR GATES	21	20	25	18	20	
L 701	L1-07	DO YOU USE OR REFER TO TRUTH TABLES FOR OR LOGIC SYMBOLS OR GATES	20	20	20	18	20	
L 702	L1-08	DO YOU USE OR REFER TO TRUTH TABLES FOR AND OR OR LOGIC SYMBOLS WITH STATE INDICATORS	21	20	25	16	20	
L 703	L1-09	DO YOU USE OR REFER TO TRUTH TABLES FOR EXCLUSIVE OR LOGIC SYMBOLS	21	21	20	18	20	
L 704	L1-10	DO YOU USE OR REFER TO LOGIC SYMBOLS FOR AND GATES	27	27	35	24	25	
L 705	L1-11	DO YOU USE OR REFER TO LOGIC SYMBOLS FOR OR GATES	27	26	30	24	25	
L 706	L1-12	DO YOU USE OR REFER TO LOGIC SYMBOLS FOR NAND OR NOR GATES	27	27	30	25	25	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
L 707	L1-13 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR EXCLUSIVE OR GATES	25	25	25	23	25	
L 708	L2-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS RELATING TO BOOLEAN EQUATIONS, LOGIC DIAGRAMS, OR LOGIC CIRCUITS	18	19	5	16	20	
L 709	L2-02 DO YOU DRAW LOGIC SYMBOLS FOR DIRECT COUPLED TRANSISTOR LOGIC (DCTL) CIRCUITS	9	10	0	9	5	BOOLEAN EQUATIONS
L 710	L2-03 DO YOU CONSTRUCT TRUTH TABLES FOR CURRENT MODE LOGIC (CML) CIRCUITS	8	9	0	9	5	
L 711	L2-04 DO YOU DRAW LOGIC DIAGRAMS FROM GIVEN BOOLEAN EQUATIONS	7	8	0	8	5	
L 712	L2-05 DO YOU MEASURE INPUTS OR OUTPUTS OF LOGIC GATES	16	16	10	16	10	
L 713	L2-06 DO YOU DEVELOP OR ANALYZE BOOLEAN EQUATIONS IN THE PROCESS OF TROUBLESHOOTING DIGITAL CIRCUITS	8	9	0	9	5	
L 714	L2-07 DO YOU ANALYZE LOGIC CIRCUITS BY USING BOOLEAN ALGEBRA	9	9	0	9	5	
L 715	L2-08 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR DIRECT COUPLED TRANSISTOR LOGIC (DCTL) CIRCUIT GATES	15	16	0	15	5	
L 716	L2-09 DO YOU USE OR REFER TO TRUTH TABLES FOR CURRENT MODE LOGIC (CML) CIRCUITS	10	11	0	10	5	
L 717	L2-10 DO YOU USE OR REFER TO LOGIC DIAGRAMS CONSISTING OF MORE THAN ONE GATE	17	18	0	16	10	
L 718	L2-11 DO YOU COMPUTE SUM AND CARRY EXPRESSIONS FOR SERIAL HALF OR FULL ADDER LOGIC DIAGRAMS	7	8	0	7	5	
L 719	L2-12 DO YOU TRACE DATA FLOW THROUGH PARALLEL FULL ADDER LOGIC DIAGRAMS	12	13	0	11	10	
L 720	L2-13 DO YOU WORK WITH ASTABLE (FREE RUNNING) MULTIVIBRATORS	20	21	5	20	20	
L 721	L2-14 DO YOU WORK WITH BISTABLE (FLIP-FLOP) MULTIVIBRATORS	19	21	5	18	20	
L 722	L2-15 DO YOU WORK WITH MONOSTABLE (ONE-SHOT) MULTIVIBRATORS	20	21	5	20	20	
L 723	L2-16 DO YOU USE OR REFER TO FLIP-FLOP MULTIVIBRATOR SYMBOLS	20	21	5	19	20	
L 724	L2-17 DO YOU USE OR REFER TO SINGLE-SHOT MULTIVIBRATOR SYMBOLS	20	21	5	20	20	
L 725	L2-18 DO YOU USE OR REFER TO FLIP-FLOP CIRCUIT DIAGRAMS	19	21	5	18	20	
L 726	L2-19 DO YOU USE OR REFER TO FLIP-FLOP TRUTH TABLES	14	17	5	14	15	
L 727	L2-20 DO YOU USE OR REFER TO COMPLEMENTED FLIP-FLOP LOGIC SYMBOLS	17	18	5	17	10	
L 728	L2-21 DO YOU USE OR REFER TO COMPLEMENTING FLIP-FLOP LOGIC SYMBOLS	17	18	5	17	10	
L 729	L2-22 DO YOU MEASURE OUTPUT WAVESHAPES OF LOGIC CIRCUITS	17	18	5	16	20	
L 730	L2-23 DO YOU TRACE DATA FLOW THROUGH COMPLEMENTED FLIP-FLOP SCHEMATIC DIAGRAMS	16	17	5	15	20	
L 731	L2-24 DO YOU TRACE DATA FLOW THROUGH COMPLEMENTING FLIP-FLOP SCHEMATIC DIAGRAMS	15	16	5	14	20	
L 732	L2-25 DO YOU CONSTRUCT TRUTH TABLES FOR J-K FLIP-FLOP LOGIC SYMBOLS	12	13	0	12	10	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
L 733	L3-01	DO YOU WORK WITH DIGITAL COUNTERS IN YOUR PRESENT JOB	28	28	30	25	30	
L 734	L3-02	DO YOU USE OR REFER TO UP-COUNTERS	21	21	20	19	10	
L 735	L3-03	DO YOU USE OR REFER TO DOWN-COUNTERS	27	27	25	24	25	
L 736	L3-04	DO YOU USE OR REFER TO SERIAL COUNTERS	19	20	15	17	10	COUNTERS
L 737	L3-05	DO YOU USE OR REFER TO PARALLEL COUNTERS	15	16	10	13	10	
L 738	L3-06	DO YOU USE OR REFER TO RING COUNTERS	14	14	10	13	5	
L 739	L3-07	DO YOU USE OR REFER TO DECADE COUNTERS	18	18	15	16	15	
L 740	L3-08	DO YOU USE OR REFER TO COUNT DETECT CIRCUITS	18	18	15	16	10	
L 741	L3-09	DO YOU USE OR REFER TO DOWN CLOCKS	19	20	15	18	10	
L 742	L3-10	DO YOU USE OR REFER TO UP CLOCKS	18	19	15	16	10	
L 743	L3-11	DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF UP-COUNTERS HAVING COMPLEMENTED FLIP-FLOPS	18	18	15	16	10	
L 744	L3-12	DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF SERIAL UP- OR DOWN-COUNTERS HAVING COMPLEMENTING FLIP-FLOPS	20	20	20	18	15	
L 745	L3-13	DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF DECADE COUNTERS	15	16	10	16	10	
L 746	L3-14	DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF RING COUNTERS	12	13	10	12	5	
L 747	L3-15	DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF SERIAL UP-COUNTERS FEEDING A PARALLEL STORAGE REGISTER	14	15	10	13	5	
L 748	L3-16	DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF SHIFT REGISTERS	14	15	10	13	5	
L 749	L3-17	DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF OTHER TYPE OF COUNTERS	15	16	0	16	5	
L 750	L3-18	DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR UP-COUNTERS HAVING COMPLEMENTED FLIP-FLOPS	13	13	10	11	5	
L 751	L3-19	DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR SERIAL UP- OR DOWN-COUNTERS HAVING COMPLEMENTING FLIP-FLOPS	12	13	5	11	5	
L 752	L3-20	DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR SERIAL UP-COUNTERS FEEDING A PARALLEL STORAGE REGISTERS	10	11	5	9	5	
L 753	L3-21	DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR OTHER TYPES OF COUNTERS	11	12	0	11	5	
L 754	L3-22	DO YOU CONSTRUCT TRUTH TABLES FROM LOGIC DIAGRAMS OF DECADE COUNTERS	8	9	0	9	5	
L 755	L3-23	DO YOU DETERMINE THE STATE OF EACH FLIP-FLOP IN RING COUNTERS FOR SPECIFIC INPUT PULSES	12	13	5	13	5	
L 756	L3-24	DO YOU DETERMINE THE APPROPRIATE AND GATE NECESSARY IN COUNT DETECT CIRCUITS TO INDICATE A REQUIRED COUNT	14	14	10	13	5	
M 757	M1-01	DO YOU WORK WITH SAWTOOTH WAVE GENERATORS	76	75	85	75	80	
M 758	M1-02	DO YOU WORK WITH TRAPEZOIDAL WAVE GENERATORS	63	62	65	65	60	
M 759	M1-03	DO YOU WORK WITH PULSED OSCILLATORS WITH REGENERATIVE FEEDBACK	60	59	70	60	55	
M 760	M1-04	DO YOU WORK WITH PULSED OSCILLATORS WITHOUT REGENERATIVE FEEDBACK	51	51	55	51	40	TIMING CIRCUITS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
M 761	M1-05 DO YOU WORK WITH BLOCKING OSCILLATORS	67	65	85	68	65	
M 762	M1-06 DO YOU USE OR REFER TO RISE TIME	62	62	65	63	65	
M 763	M1-07 DO YOU USE OR REFER TO FALL OR FLYBACK TIME	67	66	75	66	75	
M 764	M1-08 DO YOU USE OR REFER TO SWEEP TIME	71	71	75	72	80	
M 765	M1-09 DO YOU USE OR REFER TO ELECTRICAL LENGTH OF SAWTOOTH WAVEFORMS	58	59	45	58	65	
M 766	M1-10 DO YOU USE OR REFER TO PHYSICAL LENGTH OF SAWTOOTH WAVEFORMS	56	58	35	55	65	
M 767	M1-11 DO YOU USE OR REFER TO LINEAR SLOPE OF SAWTOOTH WAVEFORMS	61	63	40	63	75	
M 768	M1-12 DO YOU USE OR REFER TO GATE LENGTH OF SAWTOOTH WAVEFORMS	41	43	15	41	45	
M 769	M2-01 DO YOU USE SIGNAL GENERATORS IN YOUR PRESENT JOB	75	74	80	72	75	
M 770	M2-02 DO YOU PERFORM OPERATIONAL CHECKS WHILE USING SIGNAL GENERATORS	75	74	80	72	75	
M 771	M2-03 DO YOU PERFORM PERIODIC MAINTENANCE SUCH AS ADJUSTING, ALIGNING, OR CALIBRATING WHILE USING SIGNAL GENERATORS	62	63	50	63	65	USE OF SIGNAL GENERATORS
M 772	M2-04 DO YOU TROUBLESHOOT TO AN ASSEMBLY OR SUBASSEMBLY WHILE USING SIGNAL GENERATORS	58	59	55	57	75	
M 773	M2-05 DO YOU TROUBLESHOOT TO THE SMALLEST REPLACEABLE COMPONENT WHILE USING SIGNAL GENERATORS	55	55	55	53	70	
M 774	M2-06 DO YOU USE AUDIO SINE-WAVE GENERATORS	67	65	80	61	65	
M 775	M2-07 DO YOU USE AUDIO NON-SINUSOIDAL WAVE GENERATORS SUCH AS SQUARE WAVE, TRIANGLE, PULSE, OR SPIKE	36	37	25	38	35	
M 776	M2-08 DO YOU USE RF GENERATORS LESS THAN 1,000 MH	36	37	30	34	40	
M 777	M2-09 DO YOU USE RF GENERATORS GREATER THAN 1,000 MH	27	28	10	30	15	
M 778	M2-10 DO YOU USE OTHER SPECIAL PURPOSE OR MULTI-FUNCTION GENERATORS	58	58	55	59	55	
M 779	M3-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS DEALING WITH ALTERNATING CURRENT OR DIRECT CURRENT MOTORS OR GENERATORS	45	43	65	38	45	
M 780	M3-02 DO YOU INSPECT MOTORS	44	43	60	39	45	MOTORS AND GENERATORS
M 781	M3-03 DO YOU CLEAN OR LUBRICATE MOTORS	44	43	60	39	45	
M 782	M3-04 DO YOU OPERATE MOTORS	41	40	55	36	45	
M 783	M3-05 DO YOU REMOVE OR REPLACE COMPLETE MOTORS	43	42	60	38	45	
M 784	M3-06 DO YOU REMOVE OR REPLACE MOTOR PARTS	27	27	30	24	40	
M 785	M3-07 DO YOU TROUBLESHOOT AS FAR AS CHECKING WIRE CONNECTIONS OF MOTORS	43	42	60	38	45	
M 786	M3-08 DO YOU TROUBLESHOOT DOWN TO COMPONENT PARTS OF MOTORS	28	28	30	25	40	
M 787	M3-09 DO YOU PERFORM ANY TASKS ON FIELD COILS	15	15	15	15	5	
M 788	M3-10 DO YOU PERFORM ANY TASKS ON ARMATURES	19	19	20	18	10	
M 789	M3-11 DO YOU PERFORM ANY TASKS ON ROTORS	20	19	25	20	10	
M 790	M3-12 DO YOU PERFORM ANY TASKS ON BRUSHES	30	30	35	28	30	
M 791	M3-13 DO YOU PERFORM ANY TASKS ON SLIP RINGS	24	24	20	23	25	
M 792	M3-14 DO YOU PERFORM ANY TASKS ON COMMUTATORS	20	20	20	18	25	
M 793	M3-15 DO YOU PERFORM ANY TASKS ON POLE PIECES	15	15	10	14	10	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-YSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
M	794	M3-16 DO YOU DETERMINE OR MEASURE THE MAGNITUDE OF THE FORCE OR TORQUE CREATED BY A MOTOR	13	13	20	13	10	
M	795	M3-17 DO YOU DETERMINE OR MEASURE THE DIRECTION OF THE MECHANICAL FORCE OR TORQUE CREATED BY A MOTOR	15	14	20	13	10	
M	796	M3-18 DO YOU DETERMINE OR MEASURE THE MAGNITUDE OR DIRECTION OF THE INDUCED VOLTAGE IN MOTORS	11	11	15	11	5	
M	797	M3-19 DO YOU WORK WITH SYNCHRONOUS MOTORS	34	33	45	32	20	
M	798	M3-20 DO YOU WORK WITH INDUCTION MOTORS	27	27	30	25	20	
M	799	M3-21 DO YOU WORK WITH SPLIT-PHASE MOTORS	15	16	10	16	10	
M	800	M3-22 DO YOU WORK WITH SOME COMBINATION OF THE ABOVE MOTORS	24	23	30	20	20	
M	801	M3-23 DO YOU INSPECT GENERATORS	9	9	10	9	5	
M	802	M3-24 DO YOU CLEAN OR LUBRICATE GENERATORS	8	8	5	9	5	
M	803	M3-25 DO YOU OPERATE GENERATORS	10	10	10	11	5	
M	804	M3-26 DO YOU REMOVE OR REPLACE COMPLETE GENERATORS	7	8	5	9	5	
M	805	M3-27 DO YOU REMOVE OR REPLACE GENERATOR PARTS	5	6	0	7	0	
M	806	M3-28 DO YOU TROUBLESHOOT AS FAR AS CHECKING WIRE CONNECTIONS OF GENERATORS	8	8	5	10	0	
M	807	M3-29 DO YOU TROUBLESHOOT DOWN TO COMPONENT PARTS OF GENERATORS	6	6	0	7	0	
N	808	N1-01 DO YOU WORK WITH METERS IN YOUR PRESENT JOB	82	80	95	78	80	
N	809	N1-02 DO YOU CONCEPTUALIZE OR CONSIDER THE FUNCTIONS OF PERMANENT MAGNETS	28	30	15	27	25	
N	810	N1-03 DO YOU CONCEPTUALIZE OR CONSIDER THE FUNCTIONS OF MOVING COILS	28	29	20	27	30	METER MOVEMENTS
N	811	N1-04 DO YOU CONCEPTUALIZE OR CONSIDER THE FUNCTIONS OF SPIRAL SPRINGS	24	24	15	20	30	
N	812	N1-05 DO YOU READ METER SCALES	85	84	95	80	85	
N	813	N1-06 DO YOU EXTEND THE RANGE OF AMMETERS	33	33	25	36	40	
N	814	N1-07 DO YOU ZERO OHMMETERS	84	83	95	80	85	
N	815	N1-08 DO YOU ZERO AMMETERS	48	48	45	49	55	
N	816	N1-09 DO YOU EXTEND THE RANGE OF VOLTMETERS	53	53	50	54	50	
N	817	N1-10 DO YOU USE OR REFER TO VOLTMETER SENSITIVITY (EXPRESSED IN UNITS OF OHMS PER VOLT)	53	54	45	55	45	
N	818	N2-01 DO YOU WORK WITH SATURABLE REACTORS OR MAGNETIC AMPLIFIERS IN YOUR PRESENT JOB	6	6	5	5	0	
N	819	N2-02 DO YOU INSPECT MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	4	4	5	4	0	SATURABLE REACTORS AND MAGNETIC AMPLIFIERS
N	820	N2-03 DO YOU CLEAN MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	4	4	0	4	0	
N	821	N2-04 DO YOU ADJUST MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	3	4	0	3	0	
N	822	N2-05 DO YOU TROUBLESHOOT MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	4	4	5	4	0	
N	823	N2-06 DO YOU REMOVE OR REPLACE MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	4	4	5	5	0	
N	824	N2-07 DO YOU REMOVE OR REPLACE MAGNETIC AMPLIFIER OR SATURABLE REACTOR COMPONENTS	3	3	0	3	0	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
N	825	N2-08 DO YOU USE OR REFER TO HYSTERESIS CURVES OR LOOPS	5	5	0	3	0	
N	826	N2-09 DO YOU INTERPRET SCHEMATIC DRAWINGS TO DEVELOP OUTPUT WAVEFORMS ACROSS REACTOR WINDINGS OR LOAD RESISTORS OF SINGLE WINDING SATURABLE REACTORS	4	4	5	3	0	
N	827	N2-10 DO YOU MEASURE OUTPUT WAVEFORMS ACROSS REACTOR WINDINGS OR LOAD RESISTORS OF SINGLE WINDING SATURABLE REACTORS	5	5	5	5	0	
N	828	N2-11 DO YOU INTERPRET SCHEMATIC DRAWINGS TO DEVELOP OUTPUT WAVEFORMS FOR MAGNETIC AMPLIFIERS	4	4	5	3	0	
N	829	N2-12 DO YOU USE OR REFER TO COERCIVE FORCE IN SATURABLE REACTORS	3	3	0	2	0	
N	830	N2-13 DO YOU USE OR REFER TO RESIDUAL MAGNETISM IN SATURABLE REACTORS	3	4	0	2	0	
N	831	N2-14 DO YOU USE OR REFER TO FLUX DENSITY IN SATURABLE REACTORS	3	4	0	2	0	
N	832	N2-15 DO YOU USE OR REFER TO POINT OF SATURATION IN SATURABLE REACTORS	3	4	0	2	0	
N	833	N2-16 DO YOU USE OR REFER TO SATURABLE REACTOR SCHEMATIC SYMBOLS	3	4	0	2	0	
N	834	N3-01 DO YOU WORK WITH WAVESHAPING CIRCUITS IN YOUR PRESENT JOB	70	69	80	66	75	
N	835	N3-02 DO YOU USE OR REFER TO TRANSIENT INTERVALS	40	42	20	45	30	
N	836	N3-03 DO YOU USE OR REFER TO PULSE WIDTH (PW)	66	65	75	63	70	WAVESHAPING CIRCUITS
N	837	N3-04 DO YOU USE OR REFER TO PULSE RECURRENCE TIME (PRT)	47	48	40	45	55	
N	838	N3-05 DO YOU USE OR REFER TO PULSE RECURRENCE FREQUENCY (PRF)	51	52	45	49	65	
N	839	N3-06 DO YOU USE OR REFER TO DIFFERENTIATING CIRCUITS	66	66	70	63	65	
N	840	N3-07 DO YOU USE OR REFER TO INTEGRATING CIRCUITS	68	67	80	64	65	
N	841	N3-08 DO YOU USE OR REFER TO THE CLASSIFICATION OF TIME CONSTANTS (TC) AS LONG, MEDIUM, OR SHORT	46	47	35	47	35	
N	842	N3-09 DO YOU DETERMINE WHETHER AN LR OR RC CIRCUIT IS DIFFERENTIATING OR INTEGRATING BASED ON THE TIME CONSTANT AND OUTPUT CONFIGURATION	36	38	25	36	30	
N	843	N3-10 DO YOU WORK WITH SQUARE WAVE GENERATORS	55	56	35	54	65	
N	844	N3-11 DO YOU WORK WITH RECTANGULAR WAVE GENERATORS	39	40	25	38	35	
O	845	O1-01 DO YOU WORK ON SINGLE SIDEBAND SYSTEMS IN YOUR PRESENT JOB	8	8	0	9	10	
O	846	O1-02 DO YOU INSPECT SSB TRANSMIT OR RECEIVE SYSTEMS	6	7	0	8	0	
O	847	O1-03 DO YOU CLEAN SSB TRANSMIT OR RECEIVE SYSTEMS	6	6	0	7	0	
O	848	O1-04 DO YOU ALIGN SSB TRANSMIT OR RECEIVE SYSTEMS	6	6	0	7	0	SINGLE SIDEBAND SYSTEMS
O	849	O1-05 DO YOU TROUBLESHOOT TO SSB TRANSMIT OR RECEIVE SYSTEMS	6	6	0	7	0	
O	850	O1-06 DO YOU TROUBLESHOOT TO SSB TRANSMIT OR RECEIVE COMPONENTS	6	7	0	8	0	
O	851	O1-07 DO YOU REMOVE OR REPLACE SSB TRANSMIT OR RECEIVE SYSTEMS	6	6	0	7	0	
O	852	O1-08 DO YOU REMOVE OR REPLACE SSB TRANSMIT OR RECEIVE COMPONENTS	6	7	0	9	0	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
0 853	01-09 DO YOU PERFORM TASKS ON SSB AUDIO AMPLIFIERS	7	8	0	9	0	
0 854	01-10 DO YOU PERFORM TASKS ON SSB BALANCED MODULATORS	6	7	0	8	0	
0 855	01-11 DO YOU PERFORM TASKS ON SSB CARRIER OSCILLATORS	6	7	0	8	0	
0 856	01-12 DO YOU PERFORM TASKS ON SSB LC FILTERS	6	7	0	9	0	
0 857	01-13 DO YOU PERFORM TASKS ON SSB CRYSTAL FILTERS	6	7	0	9	0	
0 858	01-14 DO YOU PERFORM TASKS ON SSB MECHANICAL FILTERS	6	7	0	8	0	
0 859	01-15 DO YOU PERFORM TASKS ON SSB OSCILLATORS	7	8	0	9	0	
0 860	01-16 DO YOU PERFORM TASKS ON SSB MIXERS	7	8	0	9	0	
0 861	01-17 DO YOU PERFORM TASKS ON SSB DRIVERS	6	7	0	9	0	
0 862	01-18 DO YOU PERFORM TASKS ON SSB POWER AMPLIFIERS	6	7	0	9	0	
0 863	01-19 DO YOU PERFORM TASKS ON SSB RF AMPLIFIERS	6	7	0	9	0	
0 864	01-20 DO YOU PERFORM TASKS ON SSB FREQUENCY CONVERTERS	6	7	0	8	0	
0 865	01-21 DO YOU PERFORM TASKS ON SSB IF AMPLIFIERS	6	7	0	9	0	
0 866	01-22 DO YOU PERFORM TASKS ON SSB DEMODULATORS	6	7	0	9	0	
0 867	01-23 DO YOU PERFORM TASKS ON SSB DON'T REMEMBER WHICH SSB SYSTEM STAGES	4	4	0	5	0	
0 868	01-24 DO YOU USE OR REFER TO SELECTIVE FADING	4	5	0	5	0	
0 869	01-25 DO YOU USE OR REFER TO PEAK POWER	6	7	0	8	0	
0 870	01-26 DO YOU USE OR REFER TO FREQUENCY STABILITY	6	7	0	7	0	
0 871	01-27 DO YOU USE OR REFER TO RESPONSE CURVES FOR BANDWIDTH FILTERS	6	7	0	7	0	
0 872	01-28 DO YOU CALCULATE PEAK POWER OR EFFECTIVE POWER OF SSB TRANSMITTERS	5	6	0	7	0	
0 873	01-29 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH SSB TRANSMITTER SCHEMATIC DIAGRAMS	6	6	0	7	0	
0 874	01-30 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH SSB RECEIVER SCHEMATIC DIAGRAMS	6	7	0	8	0	
0 875	02-01 DO YOU WORK ON PULSE MODULATION SYSTEMS IN YOUR PRESENT JOB	15	15	10	14	10	
0 876	02-02 DO YOU INSPECT PULSE MODULATION SYSTEMS	13	14	10	14	10	
0 877	02-03 DO YOU CLEAN PULSE MODULATION SYSTEMS	12	13	10	14	10	PULSE MODULATION SYSTEMS
0 878	02-04 DO YOU ALIGN PULSE MODULATION SYSTEMS	12	12	10	12	10	
0 879	02-05 DO YOU TROUBLESHOOT TO PULSE MODULATION SYSTEMS	13	14	10	14	10	
0 880	02-06 DO YOU TROUBLESHOOT TO PULSE MODULATION SYSTEM COMPONENTS	12	13	10	13	10	
0 881	02-07 DO YOU REMOVE OR REPLACE PULSE MODULATION SYSTEMS	12	12	10	13	10	
0 882	02-08 DO YOU REMOVE OR REPLACE PULSE MODULATION SYSTEM COMPONENTS	12	13	10	13	10	
0 883	02-09 DO YOU WORK ON PULSE-AMPLITUDE MODULATION (PAM) SYSTEMS	10	10	10	10	5	
0 884	02-10 DO YOU WORK ON PULSE-DURATION MODULATION (PDM) SYSTEMS	9	8	10	7	5	
0 885	02-11 DO YOU WORK ON PULSE-POSITION MODULATION (PPM) SYSTEMS	8	8	5	7	5	
0 886	02-12 DO YOU WORK ON PULSE-CODE MODULATION (PCM) SYSTEMS	5	5	0	5	5	
0 887	02-13 DO YOU WORK ON LINE PULSING MODULATION SYSTEMS	5	6	0	6	5	
0 888	02-14 DO YOU WORK ON DON'T REMEMBER WHICH TYPE OF MODULATION SYSTEM	6	6	0	6	10	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155
0	889	02-15 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM POWER SUPPLIES	12	13	10	13	10
0	890	02-16 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM CHARGING CHOKES AND CHARGING DIODES	7	8	5	8	5
0	891	02-17 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM PULSE FORMING NETWORKS	13	14	10	14	5
0	892	02-18 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM TIMERS	10	10	10	11	5
0	893	02-19 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM SWITCHES SUCH AS GAS THYRATRONS	4	5	0	5	5
0	894	02-20 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM PULSE TRANSFORMERS	8	8	10	7	5
0	895	02-21 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM TRANSMITTER TUBES	7	7	10	7	5
0	896	02-22 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM RF AMPLIFIERS	11	11	10	12	5
0	897	02-23 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM FREQUENCY CONVERTERS	10	10	10	11	5
0	898	02-24 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM IF AMPLIFIERS	12	13	10	13	5
0	899	02-25 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM DETECTORS	13	14	10	13	10
0	900	02-26 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM VIDEO AMPLIFIERS	14	15	10	14	10
0	901	02-27 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM POWER VIDEO AMPLIFIERS	11	11	10	12	5
0	902	02-28 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM DON'T REMEMBER WHICH PULSE MODULATION SYSTEM STAGES	3	3	0	4	5
0	903	02-29 DO YOU USE OR REFER TO PULSE RECURRENCE FREQUENCY (PRF)	10	11	0	9	10
0	904	02-30 DO YOU USE OR REFER TO PULSE RECURRENCE TIME (PRT)	10	11	0	9	10
0	905	02-31 DO YOU USE OR REFER TO PULSE WIDTH (PW)	13	14	10	12	10
0	906	02-32 DO YOU USE OR REFER TO PULSE SHAPE	13	14	10	13	10
0	907	02-33 DO YOU USE OR REFER TO PEAK POWER	11	11	10	11	5
0	908	02-34 DO YOU USE OR REFER TO AVERAGE POWER	12	12	10	11	5
0	909	02-35 DO YOU CALCULATE PULSE RECURRENCE TIME (PRT) OR PULSE RECURRENCE FREQUENCY (PRF)	6	7	0	7	0
0	910	02-36 DO YOU MEASURE PULSE RECURRENCE TIME (PRT) OR PULSE RECURRENCE FREQUENCY (PRF)	8	9	0	8	5
0	911	02-37 DO YOU USE FORMULAS TO CALCULATE AVERAGE POWER OR PEAK POWER OF PULSE MODULATION TRANSMIT SYSTEMS	6	6	10	7	0
0	912	02-38 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH PULSE MODULATION TRANSMITTER SCHEMATIC DIAGRAMS	9	9	10	9	10
0	913	02-39 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH PULSE MODULATION RECEIVER SCHEMATIC DIAGRAMS	12	13	10	13	5
0	914	03-01 DO YOU WORK WITH ANTENNAS IN YOUR PRESENT JOB	21	19	35	15	20
0	915	03-02 DO YOU INSPECT ANTENNAS	18	16	30	14	20

ANTENNAS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155
0 916	03-03 DO YOU CLEAN ANTENNAS	15	14	25	11	20
0 917	03-04 DO YOU PHYSICALLY ALIGN ANTENNAS	15	15	25	13	20
0 918	03-05 DO YOU ELECTRICALLY ALIGN ANTENNAS	12	11	25	9	20
0 919	03-06 DO YOU TROUBLESHOOT TO ANTENNAS	16	15	30	12	20
0 920	03-07 DO YOU TROUBLESHOOT TO ANTENNA COMPONENTS	10	10	10	9	20
0 921	03-08 DO YOU REMOVE OR INSTALL ANTENNAS	15	14	25	11	20
0 922	03-09 DO YOU REMOVE OR REPLACE COMPONENTS OF ANTENNAS	10	10	15	8	20
0 923	03-10 DO YOU USE OR REFER TO TECHNICAL DATA CONTAINING REPRESENTATIONS OF E OR ELECTRIC FIELD LINES	8	8	10	6	10
0 924	03-11 DO YOU USE OR REFER TO TECHNICAL DATA CONTAINING REPRESENTATIONS OF H OR MAGNETIC FIELD LINES	9	8	10	7	10
0 925	03-12 DO YOU DETERMINE THE DIRECTION OF THE MAGNETIC LINES IN RELATION TO THE ELECTRIC LINES OF FORCE FOR ANTENNAS	8	8	10	6	5
0 926	03-13 DO YOU USE OR REFER TO THE GENERAL RULE THAT ANTENNAS WHICH ARE OF CORRECT LENGTH (HALF-WAVE) ACT AS INDUCTIVE LOADS TO THE GENERATOR	8	8	5	8	5
0 927	03-14 DO YOU USE OR REFER TO THE GENERAL RULE THAT ANTENNAS WHICH ARE LONGER THAN A HALF-WAVE ACT AS INDUCTIVE LOADS TO THE GENERATOR	9	8	10	7	10
0 928	03-15 DO YOU USE OR REFER TO THE GENERAL RULE THAT ANTENNAS WHICH ARE SHORTER THAN A HALF-WAVE ACT AS CAPACITIVE LOADS TO THE GENERATOR	10	10	10	9	10
0 929	03-16 DO YOU WORK WITH HERTZ ANTENNAS	10	9	15	9	15
0 930	03-17 DO YOU WORK WITH MARCONI ANTENNAS	8	8	5	8	15
0 931	03-18 DO YOU WORK WITH BROADSIDE ARRAYS	6	6	15	5	10
0 932	03-19 DO YOU WORK WITH END-FIRE ARRAYS	6	5	10	5	15
0 933	03-20 DO YOU WORK WITH CARDIOID ARRAYS	6	6	5	7	15
0 934	03-21 DO YOU WORK WITH COLLINEAR ARRAYS	6	5	10	5	10
0 935	03-22 DO YOU USE OR REFER TO THE TERM ELECTROMAGNETIC INDUCTION FIELDS WHEN WORKING WITH ANTENNAS	9	9	10	7	5
0 936	03-23 DO YOU MEASURE ELECTROMAGNETIC INDUCTION FIELDS OF ANTENNAS	6	6	10	6	5
0 937	03-24 DO YOU USE OR REFER TO THE TERM ELECTROMAGNETIC RADIATION FIELDS WHEN WORKING WITH ANTENNAS	8	8	5	7	5
0 938	03-25 DO YOU MEASURE ELECTROMAGNETIC RADIATION FIELDS OF ANTENNAS	6	6	5	7	5
0 939	03-26 DO YOU USE OR REFER TO THE TIME PHASE OF ELECTRIC (E) AND MAGNETIC (H) COMPONENTS IN ANTENNA RADIATION	6	7	0	6	5
0 940	03-27 DO YOU USE OR REFER TO THE TIME PHASE OF ELECTRIC (E) AND MAGNETIC (H) COMPONENTS IN ANTENNA INDUCTION FIELD	6	6	0	5	5
0 941	03-28 ARE ANY OF THE ANTENNAS YOU WORK ON LINEARLY POLARIZED	9	8	15	8	10
0 942	03-29 ARE ANY OF THE ANTENNAS YOU WORK ON CIRCULARLY POLARIZED	6	6	15	7	5
0 943	03-30 DO YOU MEASURE OR DETERMINE THE POLARITY OF ANTENNAS YOU WORK ON	7	7	5	5	10
0 944	03-31 DO YOU CONSTRUCT, OR MAKE THE CALCULATIONS NECESSARY TO CONSTRUCT, ANTENNAS OF CORRECT LENGTH FOR SPECIFIC WAVELENGTHS	7	7	5	6	10

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
O 945	03-32 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN PARASITIC ELEMENTS	10	10	15	8	15	
O 946	03-33 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN PARASITIC ELEMENTS SERVING AS DIRECTORS	10	9	15	8	15	
O 947	03-34 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN PARASITIC ELEMENTS SERVING AS REFLECTORS	10	10	15	8	15	
O 948	03-35 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN DON'T REMEMBER WHAT KIND OF ELEMENTS	6	6	15	5	0	
O 949	03-36 DO YOU WORK ON UNIDIRECTIONAL ANTENNAS	13	13	15	9	15	
O 950	03-37 DO YOU WORK ON BIDIRECTIONAL ANTENNAS	11	11	10	11	5	
O 951	03-38 DO YOU WORK ON DON'T REMEMBER THE DIRECTIONALITY	4	3	10	4	0	
O 952	03-39 DO YOU WORK WITH ROTAR ANTENNA ARRAYS	5	6	0	7	5	
P 953	P1-01 IN YOUR PRESENT JOB DO YOU WORK WITH TRANSMISSION LINES (TRANSMISSION LINES ARE DEFINED TO INCLUDE LEADS BETWEEN RECEIVERS AND ANTENNAS, TELEPHONE LEADS, AS WELL AS HIGH VOLTAGE POWER LINES, ETC. DO NOT CONSIDER WAVEGUIDES AS TRANSMISSION LINES	52	54	30	55	50	TRANSMISSION LINES
P 954	P1-02 DO YOU REFER TO OR USE COPPER LOSS OR I2R LOSS IN TRANSMISSION LINES	12	13	0	14	5	
P 955	P1-03 DO YOU REFER TO OR USE SKIN EFFECTS OF HIGH FREQUENCY CURRENTS IN TRANSMISSION LINES	14	15	10	15	10	
P 956	P1-04 DO YOU REFER TO OR USE RADIATION LOSS IN TRANSMISSION LINES	21	21	15	21	20	
P 957	P1-05 DO YOU USE OR REFER TO DIELECTRIC LOSS IN TRANSMISSION LINES	21	22	10	21	20	
P 958	P1-06 DO YOU USE OR REFER TO LEAKAGE LOSSES IN TRANSMISSION LINES	25	25	20	28	15	
P 959	P1-07 DO YOU WORK WITH TWISTED PAIR TRANSMISSION LINES	18	17	25	19	15	
P 960	P1-08 DO YOU WORK WITH TWIN LEAD TRANSMISSION LINES	30	31	25	34	35	
P 961	P1-09 DO YOU WORK WITH OPEN TWO-WIRE TRANSMISSION LINES	9	9	5	11	10	
P 962	P1-10 DO YOU WORK WITH FLEXIBLE COAXIAL CABLE TRANSMISSION LINES	53	54	35	55	50	
P 963	P1-11 DO YOU WORK WITH RIGID COAXIAL CABLE TRANSMISSION LINES	18	17	25	20	10	
P 964	P1-12 DO YOU TROUBLESHOOT TRANSMISSION LINES	44	45	35	49	35	
P 965	P1-13 DO YOU ANALYZE VOLTAGE OR CURRENT WAVEFORMS IN TRANSMISSION LINES TO DETERMINE THE TYPE OF TERMINATION (OPEN, SHORTED, CAPACITIVE, INDUCTIVE)	17	17	15	20	10	
P 966	P1-14 DO YOU SELECT APPROPRIATE TRANSMISSION LINES TERMINATIONS TO ACHIEVE DESIRED WAVEFORMS	33	33	25	36	35	
P 967	P1-15 DO YOU USE OR REFER TO SCHEMATIC SYMBOLS FOR LINE TERMINATIONS IN TERMS OF CIRCUIT TERMINATIONS	34	34	30	38	30	
P 968	P1-16 DO YOU MEASURE STANDING WAVE RATIOS (SR) OF TRANSMISSION LINES	16	15	30	15	20	
P 969	P1-17 DO YOU CALCULATE STANDING WAVE RATIOS (SWR) OF TRANSMISSION LINES	9	9	15	9	5	
P 970	P1-18 DO YOU PERFORM THE CALCULATIONS NECESSARY TO DETERMINE THE IMPEDANCE AND LENGTH OF QUARTER - WAVELENGTH MATCHING TRANSFORMERS TO MATCH TRANSMISSION LINES TO LOADS	11	11	10	13	5	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
P 971	P1-19 DO YOU WORK WITH TRANSMISSION LINES WHICH ARE MATCHED TO LOADS USING MATCHING TRANSFORMERS	33	34	25	38	30	
P 972	P1-20 DO YOU WORK WITH TRANSMISSION LINES WHICH ARE MATCHED TO LOADS USING DELTA MATCHING	8	8	0	8	5	
P 973	P1-21 DO YOU SELECT THE TYPE OF TRANSMISSION LINE NEEDED FOR PARTICULAR JOBS WITHOUT REFERRING TO TECHNICAL DATA	16	17	5	16	15	
P 974	P1-22 DO YOU USE OR REFER TO THE TERM CHARACTERISTIC IMPEDANCE (ZO) OF TRANSMISSION LINES	36	37	25	38	35	
P 975	P1-23 DO YOU CALCULATE THE CHARACTERISTIC IMPEDANCE (ZO) OF TRANSMISSION LINES	8	8	5	9	5	
P 976	P1-24 DO YOU USE OR REFER TO THE TERM CUTOFF FREQUENCY OF TRANSMISSION LINES	9	9	5	8	10	
P 977	P1-25 DO YOU USE OR REFER TO THE TERM VELOCITY FACTOR (K) OF TRANSMISSION LINES	6	7	0	7	5	
P 978	P1-26 DO YOU COMPUTE THE ELECTRICAL LENGTH OF TRANSMISSION LINES FOR PARTICULAR FREQUENCIES	10	10	10	9	10	
P 979	P1-27 DO YOU CONSTRUCT TRANSMISSION LINES OF PARTICULAR ELECTRICAL LENGTH FOR GIVEN FREQUENCIES	10	11	0	10	10	
P 980	P1-28 DO YOU USE OR REFER TO THE GENERAL RULE THAT AS THE FREQUENCY INCREASES AND THE PHYSICAL LENGTH OF TRANSMISSION LINES REMAIN CONSTANT, THE ELECTRICAL LENGTH INCREASES	12	13	5	13	5	
P 981	P1-29 DO YOU WORK WITH NONRESONANT (FLAT) TRANSMISSION LINES	17	18	5	18	10	
P 982	P1-30 DO YOU WORK WITH RESONANT TRANSMISSION LINES	21	23	5	22	20	
P 983	P1-31 DO YOU WORK WITH TRANSMISSION LINES WHICH ARE MATCHED TO LOADS USING STUB MATCHING	11	11	10	12	5	
P 984	P2-01 DO YOU WORK WITH WAVEGUIDES OR CAVITY RESONATORS IN YOUR PRESENT JOB	6	6	10	4	15	
P 985	P2-02 DO YOU INSPECT WAVEGUIDES OR CAVITY RESONATORS	5	4	10	4	15	
P 986	P2-03 DO YOU CLEAN WAVEGUIDES OR CAVITY RESONATORS	5	5	5	5	15	WAVEGUIDES AND CAVITY RESONATORS
P 987	P2-04 DO YOU BEND WAVEGUIDES OR CAVITY RESONATORS	3	3	0	3	5	
P 988	P2-05 DO YOU TWIST WAVEGUIDES OR CAVITY RESONATORS	3	3	0	3	5	
P 989	P2-06 DO YOU PRESSURIZE WAVEGUIDES OR CAVITY RESONATORS	4	4	5	4	15	
P 990	P2-07 DO YOU PURGE WAVEGUIDES OR CAVITY RESONATORS	3	4	0	4	10	
P 991	P2-08 DO YOU TROUBLESHOOT WAVEGUIDES OR CAVITY RESONATORS	4	4	5	4	15	
P 992	P2-09 DO YOU REMOVE OR INSTALL COMPLETE WAVEGUIDES	3	3	0	3	10	
P 993	P2-10 DO YOU REMOVE OR INSTALL WAVEGUIDE SECTIONS	3	3	0	3	10	
P 994	P2-11 DO YOU REMOVE OR INSTALL DUMMY LOADS	3	3	5	3	5	
P 995	P2-12 DO YOU REMOVE OR INSTALL E BENDS	3	3	0	3	5	
P 996	P2-13 DO YOU REMOVE OR INSTALL H BENDS	3	3	0	4	5	
P 997	P2-14 DO YOU REMOVE OR INSTALL OTHER BENDS	3	3	0	3	10	
P 998	P2-15 DO YOU REMOVE OR INSTALL CHOKE JOINTS	3	3	0	3	10	
P 999	P2-16 DO YOU REMOVE OR INSTALL ROTATING JOINTS	3	3	0	3	5	
P1000	P2-17 DO YOU REMOVE OR INSTALL DIRECTIONAL COUPLERS	3	3	5	3	5	
P1001	P2-18 DO YOU REMOVE OR INSTALL BIDIRECTIONAL COUPLERS	3	3	5	3	5	
P1002	P2-19 DO YOU USE OR REFER TO "A" WALL OF WAVEGUIDES	3	3	5	3	5	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155
P1003	P2-20 DO YOU USE OR REFER TO "B" WALL OF WAVEGUIDES	3	3	0	3	5
P1004	P2-21 DO YOU USE OR REFER TO CUTOFF FREQUENCY OF WAVEGUIDES	4	4	5	4	5
P1005	P2-22 DO YOU USE OR REFER TO FREQUENCY-DETERMINING WALL OF WAVEGUIDES	3	3	0	3	5
P1006	P2-23 DO YOU USE OR REFER TO POWER-DETERMINING WALL OF WAVEGUIDES	3	3	5	3	5
P1007	P2-24 DO YOU USE OR REFER TO ELECTRIC FIELD BOUNDARY CONDITIONS	3	3	0	3	5
P1008	P2-25 DO YOU USE OR REFER TO MAGNETIC FIELD BOUNDARY CONDITIONS	3	3	0	3	5
P1009	P2-26 DO YOU USE OR REFER TO DUPLEXER FIELD BOUNDARY CONDITIONS	3	3	0	3	5
P1010	P2-27 DO YOU USE OR REFER TO THE GENERAL RULE THAT MOST WAVEGUIDES ARE MADE WITH A "B" WALL SIZE OF .7 WAVELENGTHS OF THE OPERATING FREQUENCY	3	3	0	3	5
P1011	P2-28 DO YOU USE OR REFER TO THE GENERAL RULE THAT MOST "A" WALLS RANGE FROM .2 TO .5 WAVELENGTHS IN SIZE, WITH .35 USED AS AN AVERAGE	2	2	0	2	5
P1012	P2-29 ARE YOU CONCERNED WITH THE MATERIAL (SUCH AS BRASS) WHICH WAVEGUIDES ARE MADE OF	3	3	5	3	5
P1013	P2-30 DO YOU COMPUTE THE LENGTH OF A WAVEGUIDE FOR SPECIFIC INSTALLATION	2	2	0	2	5
P1014	P2-31 DO YOU USE THE RIGHT HAND RULE TO DETERMINE THE DIRECTION OF PROPAGATION, DIRECTION OF "E" FIELD, OR DIRECTION OF "H" FIELD IN WAVEGUIDES	3	3	0	3	5
P1015	P2-32 DO YOU USE OR REFER TO THE TIME PHASE OF PEAK "E" OR "H" LINES IN WAVEGUIDES	3	3	0	3	5
P1016	P2-33 DO YOU MEASURE THE TIME PHASE OF "E" OR "H" LINES IN WAVEGUIDES	3	3	0	3	5
P1017	P2-34 DO YOU USE OR REFER TO THE SPACE QUADRATURE OF "E" OR "H" LINES IN WAVEGUIDES	3	3	0	3	5
P1018	P2-35 ARE HIGH POWER PROBES USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	2	2	0	3	5
P1019	P2-36 ARE LOW POWER PROBES USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	3	2	5	3	5
P1020	P2-37 ARE LOOPS USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	3	3	0	3	5
P1021	P2-38 ARE APERTURES (WINDOWS OR IRISES) USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	3	3	5	3	5
P1022	P2-39 ARE DON'T REMEMBER THE KIND OF ENERGY COUPLING USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	1	1	0	1	5
P1023	P2-40 DO YOU DETERMINE WHERE PROBES SHOULD BE MOUNTED IN WAVEGUIDES OR CAVITY RESONATORS WITHOUT REFERRING TO TECHNICAL DATA	2	2	0	2	5
P1024	P2-41 DO YOU DETERMINE THE POSITIONING OF LOOPS IN WAVEGUIDES OR CAVITY RESONATORS WITHOUT REFERRING TO TECHNICAL DATA	2	2	0	2	5

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
P1025	P2-42 DO YOU DETERMINE THE POSITIONING OR SIZE OF APERTURES IN WAVEGUIDES OR CAVITY RESONATORS WITHOUT REFERRING TO TECHNICAL DATA	2	2	0	2	5	
P1026	P2-43 ARE CHOKE JOINTS USED IN WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	3	2	5	3	5	
P1027	P2-44 ARE ROTATING JOINTS USED IN WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	3	3	0	3	5	
P1028	P2-45 ARE DON'T REMEMBER THE KIND OF JOINTS USED IN WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	2	2	5	1	10	
P1029	P2-46 DO YOU TUNE CAVITY RESONATORS USING CAPACITIVE TUNING	3	2	10	3	5	
P1030	P2-47 DO YOU TUNE CAVITY RESONATORS USING INDUCTIVE TUNING	3	3	5	3	5	
P1031	P2-48 DO YOU TUNE CAVITY RESONATORS USING VOLUME TUNING	3	3	0	3	5	
P1032	P2-49 DO YOU TUNE CAVITY RESONATORS USING DON'T REMEMBER THE METHOD OF TUNING	2	2	0	2	5	
P1033	P2-50 DO YOU MEASURE THE FREQUENCY OF SIGNALS IN CAVITY RESONATORS	3	3	5	3	5	
P1034	P3-01 IN YOUR PRESENT JOB DO YOU WORK WITH KLYSTRONS, TRAVELING WAVE TUBES (TWT), PARAMETRIC AMPLIFIERS, OR MAGNETRONS	6	5	10	5	10	MICROWAVE AMPLIFIERS AND OSCILLATORS
P1035	P3-02 DO YOU USE OR REFER TO INTERELECTRODE CAPACITANCE	4	5	0	5	5	
P1036	P3-03 DO YOU USE OR REFER TO ELECTRON TRANSIT TIME	4	5	0	5	5	
P1037	P3-04 DO YOU USE OR REFER TO LEAD INDUCTANCE	4	4	5	4	5	
P1038	P3-05 DO YOU USE OR REFER TO RF LOSSES IN EXTERNAL CIRCUITRY	4	4	5	4	5	
P1039	P3-06 DO YOU USE OR REFER TO PRINCIPLE OF ELECTRON VELOCITY MODULATION	4	4	5	5	5	
P1040	P3-07 DO YOU USE OR REFER TO ELECTRON BUNCHING	4	4	5	5	5	
P1041	P3-08 DO YOU WORK WITH TWO-CAVITY KLYSTRONS	3	3	5	3	5	
P1042	P3-09 DO YOU WORK WITH THREE-CAVITY KLYSTRONS	3	3	0	4	5	
P1043	P3-10 DO YOU WORK WITH REFLEX KLYSTRONS	5	5	5	5	10	
P1044	P3-11 DO YOU WORK WITH TRAVELING-WAVE TUBES (TWT)	3	3	0	3	5	
P1045	P3-12 DO YOU WORK WITH NONDEGENERATIVE PARAMETRIC AMPLIFIERS	3	3	0	3	5	
P1046	P3-13 DO YOU WORK WITH UP-CONVERTER PARAMETRIC AMPLIFIERS	3	3	0	3	5	
P1047	P3-14 DO YOU WORK WITH MAGNETRONS	2	2	0	3	5	
P1048	P3-15 DO YOU INSPECT KLYSTRONS OR TWT	5	5	10	5	10	
P1049	P3-16 DO YOU CLEAN KLYSTRONS OR TWT	5	5	10	5	10	
P1050	P3-17 DO YOU TUNE KLYSTRONS OR TWT ELECTRICALLY	5	4	10	5	10	
P1051	P3-18 DO YOU TUNE KLYSTRONS OR TWT MECHANICALLY	5	4	10	5	10	
P1052	P3-19 DO YOU PERFORM OPERATIONAL CHECKS OF KLYSTRONS OR TWT	5	4	10	5	10	
P1053	P3-20 DO YOU TROUBLESHOOT KLYSTRONS OR TWT	5	5	5	5	10	
P1054	P3-21 DO YOU REMOVE OR REPLACE COMPLETE KLYSTRON OR TWT	5	4	10	5	10	
P1055	P3-22 DO YOU REMOVE OR REPLACE KLYSTRON OR TWT COMPONENTS	4	3	10	4	5	
P1056	P3-23 DO YOU INSPECT PARAMETRIC AMPLIFIERS	3	4	0	5	5	
P1057	P3-24 DO YOU CLEAN PARAMETRIC AMPLIFIERS	3	4	0	5	5	
P1058	P3-25 DO YOU ADJUST PARAMETRIC AMPLIFIERS	3	4	0	5	5	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155
P1059	P3-26 DO YOU TUNE PARAMETRIC AMPLIFIERS	3	4	0	5	5
P1060	P3-27 DO YOU PERFORM OPERATIONAL CHECKS OF PARAMETRIC AMPLIFIERS	3	4	0	5	5
P1061	P3-28 DO YOU TROUBLESHOOT PARAMETRIC AMPLIFIERS	3	4	0	5	5
P1062	P3-29 DO YOU REMOVE OR REPLACE COMPLETE PARAMETRIC AMPLIFIER	3	4	0	5	5
P1063	P3-30 DO YOU REMOVE OR REPLACE PARAMETRIC AMPLIFIER COMPONENTS	3	4	0	5	5
P1064	P3-31 DO YOU INSPECT MAGNETRONS	2	2	0	3	5
P1065	P3-32 DO YOU CLEAN MAGNETRONS	2	2	0	3	5
P1066	P3-33 DO YOU ADJUST MAGNETRONS	2	2	0	3	5
P1067	P3-34 DO YOU TUNE MAGNETRONS	2	2	0	3	5
P1068	P3-35 DO YOU PERFORM OPERATIONAL CHECKS OF MAGNETRONS	2	2	0	3	5
P1069	P3-36 DO YOU TROUBLESHOOT MAGNETRONS	2	2	0	3	5
P1070	P3-37 DO YOU REMOVE OR REPLACE COMPLETE MAGNETRON	2	2	0	3	5
P1071	P3-38 DO YOU REMOVE OR REPLACE MAGNETRON COMPONENTS	2	2	0	3	5
P1072	P3-39 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS COLLECTOR PLATES	3	3	0	3	5
P1073	P3-40 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CATCHER CAVITIES	3	3	0	3	5
P1074	P3-41 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CATCHER GRIDS	3	3	0	3	5
P1075	P3-42 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS FEEDBACK LOOPS	3	3	0	3	5
P1076	P3-43 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS DRIFT SPACES	3	3	0	3	5
P1077	P3-44 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS BUNCHER GRIDS	3	3	0	3	5
P1078	P3-45 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS BUNCHER CAVITIES	3	3	0	3	5
P1079	P3-46 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CONTROL GRIDS	3	3	0	3	5
P1080	P3-47 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CATHODES	3	3	0	3	5
P1081	P3-48 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON REPELLER (REFLECTOR) PLATES	4	4	5	5	5
P1082	P3-49 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON GRIDS	4	4	5	5	5
P1083	P3-50 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON GRID CAVITY GAPS	4	4	0	5	5
P1084	P3-51 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON RESONANT CAVITIES	4	4	5	5	5
P1085	P3-52 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON MAGNETIC COUPLING LOOPS	4	4	5	5	5
P1086	P3-53 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON FILAMENTS	4	4	5	5	5
P1087	P3-54 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON CATHODES	4	4	5	5	5

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
P1088	P3-55 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON OUTPUT LEADS	4	4	5	5	5	
P1089	P3-56 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES FILAMENTS	3	3	0	3	5	
P1090	P3-57 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES CATHODES	3	3	0	3	5	
P1091	P3-58 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES MODULATOR GRIDS	3	3	0	3	5	
P1092	P3-59 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES ANODES	3	3	0	3	5	
P1093	P3-60 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES HELIXES	3	3	0	3	5	
P1094	P3-61 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES COLLECTORS	3	4	0	4	5	
P1095	P3-62 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES MAGNETS	3	4	0	4	5	
P109A	P3-63 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES ATTENUATORS	3	3	0	3	5	
P1097	P3-64 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER FERRITE CIRCULATORS	3	3	0	4	5	
P1098	P3-65 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER SIGNAL CAVITIES	3	3	0	4	5	
P1099	P3-66 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER IDLER CAVITIES	3	3	0	4	5	
P1100	P3-67 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER VARACTOR DIODES	3	3	0	4	5	
P1101	P3-68 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER FERRITE ISOLATORS	3	3	0	4	5	
P1102	P3-69 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER REVERSE-BIAS BATTERIES	3	3	0	4	5	
P1103	P3-70 DO YOU PERFORM TASKS ON ANODES	2	2	0	3	5	
P1104	P3-71 DO YOU PERFORM TASKS ON ANODE COOLING PINS	2	2	0	3	5	
P1105	P3-72 DO YOU PERFORM TASKS ON COUPLING LOOPS	2	2	0	3	5	
P1106	P3-73 DO YOU PERFORM TASKS ON HEATER LEADS	2	2	0	3	5	
P1107	P3-74 DO YOU PERFORM TASKS ON RESONANT CAVITIES	2	2	0	3	5	
P1108	P3-75 DO YOU PERFORM TASKS ON CATHODES	2	2	0	3	5	
P1109	P3-76 DO YOU PERFORM TASKS ON MAGNETS	2	2	0	3	5	
Q1110	Q1-01 DO YOU USE OR REFER TO STORAGE REGISTERS	12	12	10	10	5	
Q1111	Q1-02 DO YOU USE OR REFER TO SHIFT REGISTERS	15	14	20	13	5	
Q1112	Q1-03 DO YOU USE OR REFER TO LOGIC SYMBOLS OF SHIFT REGISTERS	14	14	15	13	5	REGISTERS
Q1113	Q1-04 DO YOU USE OR REFER TO LOGIC SYMBOLS OF STORAGE REGISTERS	12	12	10	10	5	
Q1114	Q1-05 DO YOU TRACE THE DATA FLOW THROUGH LOGIC DIAGRAMS OF SHIFT REGISTERS	13	13	15	13	5	
Q1115	Q1-06 DO YOU TRACE THE DATA FLOW THROUGH LOGIC DIAGRAMS OF OTHER TYPE OF REGISTERS	14	14	15	13	10	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
Q1116	Q1-07 DO YOU DETERMINE THE STATE OF EACH FLIP-FLOP OF A SHIFT REGISTER AFTER A SPECIFIED NUMBER OF SHIFT PULSES HAVE PASSED	13	13	15	12	5	
Q1117	Q2-01 DO YOU WORK WITH DIGITAL COUNTERS, REGISTERS, OR STORAGE DEVICES IN YOUR PRESENT JOB	21	21	20	15	40	
Q1118	Q2-02 DO YOU USE OR REFER TO DELAY LINES	20	21	10	16	35	STORAGE DEVICES
Q1119	Q2-03 DO YOU USE OR REFER TO MAGNETIC CORES	8	9	0	8	10	
Q1120	Q2-04 DO YOU USE OR REFER TO MAGNETIC DRUMS	6	7	0	6	5	
Q1121	Q2-05 DO YOU USE OR REFER TO MAGNETIC TAPES	17	16	20	13	15	
Q1122	Q2-06 DO YOU USE OR REFER TO ACCESS TIME OR SPEED OR MEMORY SYSTEMS	9	10	0	8	5	
Q1123	Q2-07 DO YOU USE OR REFER TO WORD CAPACITY OF MEMORY SYSTEMS	7	8	5	6	5	
Q1124	Q2-08 DO YOU USE OR REFER TO VOLATILITY OF MEMORY SYSTEMS	6	6	0	6	5	
Q1125	Q2-09 DO YOU USE OR REFER TO LOGIC SYMBOL OF DELAY LINES	9	10	0	9	5	
Q1126	Q3-01 IN YOUR PRESENT JOB, DO YOU WORK WITH DIGITAL-TO-ANALOG (D/A) CONVERTERS, ANALOG-TO-DIGITAL (A/D) CONVERTERS, OR BINARY-TO-DECIMAL READOUT CONVERTERS	9	9	10	5	10	DIGITAL TO ANALOG CONVERTERS
Q1127	Q3-02 DO YOU COMPUTE OUTPUT VOLTAGES FOR ELECTROMECHANICAL DIGITAL-TO-ANALOG (D/A) CONVERTERS FOR GIVEN INPUT VOLTAGES	6	6	5	5	5	
Q1128	Q3-03 DO YOU USE OR REFER TO THE GENERAL RULE THAT THE COUNT IN ELECTROMECHANICAL DIGITAL-TO-ANALOG (D/A) CONVERTERS IS DETERMINED BY ADDING THE DENOMINATORS OF THE RESISTORS	6	7	5	5	5	
Q1129	Q3-04 DO YOU COMPUTE ANALOG VOLTAGES FOR GIVEN BINARY COUNTS IN ELECTRONIC DIGITAL-TO-ANALOG (D/A) CONVERTERS	7	8	0	5	5	
Q1130	Q3-05 DO YOU PERFORM SAMPLE FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	7	7	5	5	5	
Q1131	Q3-06 DO YOU PERFORM HOLD FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	7	7	5	5	5	
Q1132	Q3-07 DO YOU PERFORM COMPARE FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	6	7	0	5	5	
Q1133	Q3-08 DO YOU PERFORM DIGITIZE FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	7	7	5	5	5	
Q1134	Q3-09 DO YOU PERFORM DON'T REMEMBER WHICH FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	3	2	5	2	0	
Q1135	Q3-10 DO YOU USE OR REFER TO SAMPLE FUNCTION OF A/D CONVERTERS	7	7	10	5	5	
Q1136	Q3-11 DO YOU USE OR REFER TO HOLD FUNCTION OF A/D CONVERTERS	7	7	10	5	5	
Q1137	Q3-12 DO YOU USE OR REFER TO COMPARE FUNCTION OF A/D CONVERTERS	7	7	10	5	5	
Q1138	Q3-13 DO YOU USE OR REFER TO DIGITAL FUNCTION OF A/D CONVERTERS	7	7	5	5	5	
Q1139	Q3-14 DO YOU PERFORM ANY TASKS ON MECHANICAL ANALOG-TO-DIGITAL (A/D) CONVERTERS	3	4	0	3	5	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
R1140	R1-01 DO YOU WORK WITH PHANTASTRON CIRCUITRY IN YOUR PRESENT JOB	2	2	0	2	5	PHANTASTRONS
R1141	R2-01 IN YOUR PRESENT JOB DO YOU WORK WITH SCHMITT TRIGGER CIRCUITS	35	35	35	34	30	
R1142	R2-02 DO YOU TRACE DATA FLOW THROUGH SCHMITT TRIGGER SCHEMATIC DIAGRAMS	27	28	15	27	20	SCHMITT TRIGGERS
R1143	R2-03 DO YOU USE OR REFER TO SCHMITT TRIGGER LOGIC SYMBOLS	24	25	15	26	15	
R1144	R3-01 IN YOUR PRESENT JOB DO YOU FABRICATE MULTICONDUCTOR CABLES	45	44	60	42	35	CABLE FABRICATION
R1145	R3-02 DO YOU FABRICATE COAXIAL CABLES	57	56	65	58	50	
S1146	S1-01 IN YOUR PRESENT JOB DO YOU PERFORM ANY TASKS ON VISUAL READOUT SYSTEMS	21	21	20	23	10	
S1147	S1-02 DO YOU PERFORM ANY TASKS ON NIXIE LIGHTS OR NIXIE LIGHT DECODER SYSTEMS	7	7	10	9	10	INPUT/OUTPUT DEVICES
S1148	S1-03 DO YOU ANALYZE NIXIE LIGHT DECODER SYSTEMS USING BOOLEAN ALGEBRA	4	5	0	6	5	
S1149	S2-01 DO YOU WORK WITH PHOTO TUBES IN YOUR PRESENT JOB	46	46	45	50	30	PHOTO SENSITIVE DEVICES
S1150	S3-01 IN YOUR PRESENT JOB DO YOU WORK WITH CHOPPER CIRCUITS	15	15	15	15	20	
S1151	S3-02 DO YOU MEASURE EXCITATION FREQUENCIES	10	11	0	10	15	
S1152	S3-03 DO YOU MEASURE VOLTAGE-CURRENT PHASE RELATIONSHIPS	8	8	5	9	10	
S1153	S3-04 DO YOU USE OR REFER TO EXCITATION FREQUENCIES	8	9	0	7	10	SYNCHRONOUS VIBRATIONS (CHOPPER CIRCUITS)
S1154	S3-05 DO YOU USE OR REFER TO VOLTAGE-CURRENT PHASE RELATIONSHIPS	7	8	5	7	10	
S1155	S3-06 DO YOU USE SERVOS IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION	11	12	5	11	15	
S1156	S3-07 DO YOU USE DETECTORS IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION	12	12	15	11	10	
S1157	S3-08 DO YOU USE ERROR SIGNAL DEVICES IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION	12	13	5	13	10	
S1158	S3-09 DO YOU USE COMPARISON CIRCUITS IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION	12	12	15	12	10	
T1159	T1-01 DOES YOUR PRESENT JOB INVOLVE ANY TASKS DEALING WITH INFRARED SYSTEMS	3	3	0	1	5	
T1160	T1-02 DO YOU INSPECT INFRARED SYSTEMS	2	2	0	2	5	
T1161	T1-03 DO YOU CLEAN INFRARED SYSTEMS	2	2	0	1	5	
T1162	T1-04 DO YOU ADJUST OR CALIBRATE INFRARED SYSTEMS	2	2	0	1	5	INFRARED
T1163	T1-05 DO YOU OPERATE INFRARED SYSTEMS	2	2	0	1	5	
T1164	T1-06 DO YOU TROUBLESHOOT WIRE CONNECTIONS OF INFRARED SYSTEMS	1	1	0	1	5	
T1165	T1-07 DO YOU TROUBLESHOOT MAJOR ASSEMBLIES OF INFRARED SYSTEMS	1	1	0	1	5	
T1166	T1-08 DO YOU TROUBLESHOOT DOWN TO INFRARED SYSTEM COMPONENT PARTS	1	1	0	1	5	
T1167	T1-09 DO YOU REMOVE OR REPLACE MAJOR ASSEMBLIES OF INFRARED SYSTEMS	1	1	0	2	0	
T1168	T1-10 DO YOU REMOVE OR REPLACE INFRARED SYSTEM COMPONENT PARTS	2	2	0	2	0	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

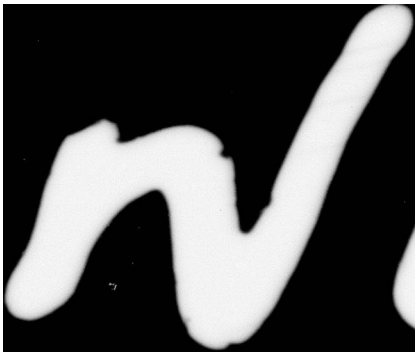
		DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
T1169	T1-11	DO YOU USE OR REFER TO FAR REGION	1	1	0	1	0	
T1170	T1-12	DO YOU USE OR REFER TO INTERMEDIATE REGION	1	1	0	0	0	
T1171	T1-13	DO YOU USE OR REFER TO NEAR REGION	0	0	0	0	0	
T1172	T1-14	DO YOU USE OR REFER TO MICRON	1	1	0	0	0	
T1173	T1-15	DO YOU USE OR REFER TO GRAY BODIES	0	0	0	0	0	
T1174	T1-16	DO YOU USE OR REFER TO BLACK BODIES	0	0	0	0	0	
T1175	T1-17	DO YOU USE OR REFER TO ABSORPTION	1	1	0	0	0	
T1176	T1-18	DO YOU USE OR REFER TO SCATTERING	1	1	0	0	0	
T1177	T1-19	DO YOU USE OR REFER TO ABSOLUTE ZERO	0	0	0	0	0	
T1178	T1-20	DO YOU PERFORM TASKS ON BLITZ	0	0	0	1	0	
T1179	T1-21	DO YOU PERFORM TASKS ON TARGET BUTTONS	0	0	0	1	0	
T1180	T1-22	DO YOU PERFORM TASKS ON ERECTOR LENSES	1	1	0	1	0	
T1181	T1-23	DO YOU PERFORM TASKS ON OCULAR LENSES	1	1	0	1	0	
T1182	T1-24	DO YOU PERFORM TASKS ON CORRECTION LENSES	1	1	0	1	0	
T1183	T1-25	DO YOU PERFORM TASKS ON FILTERS	2	2	0	1	0	
T1184	T1-26	DO YOU PERFORM TASKS ON SPHERICAL MIRRORS	0	0	0	1	0	
T1185	T1-27	DO YOU PERFORM TASKS ON PLANE MIRRORS	1	1	0	1	0	
T1186	T2-01	DOES YOUR PRESENT JOB INVOLVE ANY TASKS DEALING WITH LASERS	3	3	0	2	0	
T1187	T2-02	DO YOU INSPECT LASER SYSTEMS	1	1	0	2	0	
T1188	T2-03	DO YOU CLEAN LASER SYSTEMS	1	1	0	1	0	
T1189	T2-04	DO YOU OPERATE LASER SYSTEMS	1	1	0	2	0	LASERS
T1190	T2-05	DO YOU OPERATE LASER SYSTEMS	1	1	0	2	0	
T1191	T2-06	DO YOU TROUBLESHOOT WIRE CONNECTIONS OF LASER SYSTEMS	1	1	0	1	0	
T1192	T2-07	DO YOU TROUBLESHOOT MAJOR ASSEMBLIES OF LASER SYSTEMS	0	0	0	1	0	
T1193	T2-08	DO YOU TROUBLESHOOT TO COMPONENT PARTS OF LASER SYSTEMS	0	0	0	1	0	
T1194	T2-09	DO YOU REMOVE OR REPLACE MAJOR ASSEMBLIES OF LASER SYSTEMS	0	0	0	1	0	
T1195	T2-10	DO YOU REMOVE OR REPLACE COMPONENT PARTS OF LASER SYSTEMS	0	0	0	1	0	
T1196	T2-11	DO YOU USE OR REFER TO ANGSTROMS (A)	1	1	0	1	0	
T1197	T2-12	DO YOU USE OR REFER TO ELECTRON ENERGY LEVELS	1	1	0	1	0	
T1198	T2-13	DO YOU USE OR REFER TO GROUND STATE	2	2	0	1	5	
T1199	T2-14	DO YOU USE OR REFER TO EXCITED STATE	1	1	0	1	0	
T1200	T2-15	DO YOU USE OR REFER TO PACKET OF RADIATION	1	1	0	1	0	
T1201	T2-16	DO YOU USE OR REFER TO PHOTONS	1	1	0	1	0	
T1202	T2-17	DO YOU USE OR REFER TO SPONTANEOUS EMISSION	1	1	0	1	0	
T1203	T2-18	DO YOU USE OR REFER TO STIMULATED EMISSION	1	1	0	1	0	
T1204	T2-19	DO YOU USE OR REFER TO COHERENCE OR INCOHERENCE	1	1	0	1	0	
T1205	T2-20	DO YOU USE OR REFER TO INVERSION LEVEL	0	0	0	1	0	
T1206	T2-21	DO YOU USE OR REFER TO MONOCHROMATIC	0	0	0	1	0	
T1207	T2-22	DO YOU WORK WITH ACTIVE MATERIALS	1	1	0	1	0	
T1208	T2-23	DO YOU WORK WITH PUMPING SOURCES	1	1	0	1	0	
T1209	T2-24	DO YOU WORK WITH FULL SILVERED (100% REFLECTIVE) MIRRORS	1	1	0	1	0	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
T1210	T2-25 DO YOU WORK WITH HALF SILVERED (92% REFLECTIVE) MIRRORS	1	1	0	1	0	
T1211	T2-26 DO YOU WORK WITH HELICAL FLASHTUBES	1	1	0	1	0	
T1212	T2-27 DO YOU WORK WITH RUBY	0	0	0	1	0	
T1213	T2-28 DO YOU WORK WITH HELIUM-NEON	1	1	0	1	0	
T1214	T2-29 DO YOU WORK WITH HELIUM-XENON	0	0	0	1	0	
T1215	T2-30 DO YOU WORK WITH XENON	0	0	0	1	0	
T1216	T2-31 DO YOU WORK WITH CESIUM-HELIUM	0	0	0	1	0	
T1217	T2-32 DO YOU WORK WITH ARGON	0	0	0	1	0	
T1218	T2-33 DO YOU WORK WITH NEODYMIUM IN GLASS	0	0	0	1	0	
T1219	T2-34 DO YOU WORK WITH GALLIUM ARSENIDE	0	0	0	1	0	
T1220	T3-01 IN YOUR PRESENT JOB DO YOU WORK WITH DISPLAY TUBES, SUCH AS DIRECT VIEW STORAGE (DVST) OR MULTIPLE MODE STORAGE TUBES (MMST)	1	1	0	1	0	
T1221	T3-02 DO YOU INSPECT DVST OR MMST	1	1	0	1	0	
T1222	T3-03 DO YOU CLEAN DVST OR MMST	1	1	0	1	0	
T1223	T3-04 DO YOU ADJUST OR CALIBRATE DVST OR MMST	1	1	0	1	0	DISPLAY TUBES
T1224	T3-05 DO YOU OPERATE SYSTEMS THAT CONTAIN DVST OR MMST	1	1	0	1	0	
T1225	T3-06 DO YOU TROUBLESHOOT DVST OR MMST CIRCUITS	1	1	0	1	0	
T1226	T3-07 DO YOU REMOVE OR REPLACE DVST OR MMST TUBES FROM MAJOR ASSEMBLIES OR UNITS	1	1	0	1	0	
T1227	T3-08 DO YOU PERFORM TASKS THAT MAKE IT NECESSARY TO NAME THE VARIOUS ELEMENTS OF DVST	1	1	0	1	0	
T1228	T3-09 DO YOU PERFORM TASKS THAT MAKE IT NECESSARY TO NAME THE VARIOUS ELEMENTS OF MMST	1	1	0	1	0	
T1229	T3-10 DO YOU PERFORM TASKS ON FLOOD GUNS	0	0	0	0	0	
T1230	T3-11 DO YOU PERFORM TASKS ON WRITE GUNS	0	0	0	0	0	
T1231	T3-12 DO YOU PERFORM TASKS ON ATTACK GUNS	0	0	0	0	0	
T1232	T3-13 DO YOU PERFORM TASKS ON ERASE GUNS	0	0	0	0	0	
T1233	T3-14 DO YOU PERFORM TASKS ON STORAGE GRIDS	0	0	0	0	0	
U1234	U1-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY PROGRAMMING TASKS	3	3	0	2	0	
U1235	U1-02 DO YOU USE OR REFER TO DECIMAL SYSTEMS	2	2	0	1	0	
U1236	U1-03 DO YOU USE OR REFER TO PROGRAMS	1	1	0	1	0	PROGRAMMING
U1237	U1-04 DO YOU USE OR REFER TO HEXIDECIMAL SYSTEMS	1	1	0	1	0	
U1238	U1-05 DO YOU USE OR REFER TO 8-4-2-1 SYSTEMS	1	1	0	0	0	
U1239	U1-06 DO YOU USE OR REFER TO FOUR SYSTEMS	0	0	0	0	0	
U1240	U1-07 DO YOU USE OR REFER TO BINARY SYSTEMS	3	4	0	2	0	
U1241	U1-08 DO YOU USE OR REFER TO TIME-SHARING	2	2	0	1	0	
U1242	U1-09 DO YOU USE OR REFER TO DATA WORDS	2	2	0	1	0	
U1243	U1-10 DO YOU USE OR REFER TO ADDRESS WORDS	2	2	0	1	0	
U1244	U1-11 DO YOU USE OR REFER TO ADDRESS/SUBADDRESS	2	2	0	1	0	
U1245	U1-12 DO YOU USE OR REFER TO STEERING/INFORMATION	1	1	0	1	0	
U1246	U1-13 DO YOU USE OR REFER TO INFORMATION WORDS	1	1	0	1	0	
U1247	U1-14 DO YOU PERFORM TASKS ON SINGLE LEVEL PROGRAMMING	1	1	0	1	0	
U1248	U1-15 DO YOU PERFORM TASKS ON MULTI-LEVEL PROGRAMMING	1	1	0	0	0	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 153	SPC 154	SPC 155	
U1249	01-16 DO YOU PERFORM TASKS ON INPUT DEVICES	1	1	0	1	0	
U1250	01-17 DO YOU PERFORM TASKS ON STORAGE DEVICES	0	0	0	0	0	
U1251	01-18 DO YOU PERFORM TASKS ON ARITHMETIC SECTIONS	0	0	0	0	0	
U1252	01-19 DO YOU PERFORM TASKS ON CONTROL SECTIONS	1	1	0	1	0	
U1253	01-20 DO YOU PERFORM TASKS ON OUTPUT DEVICES	2	2	0	3	0	
U1254	01-21 DO YOU PERFORM TASKS ON POWER SUPPLIES	2	2	0	3	0	
U1255	02-01 DO YOU USE DECIBELS TO EXPRESS AMPLIFICATION AND ATTENUATION	55	55	60	54	50	
U1256	02-02 DO YOU USE LOGARITHMS TO COMPUTE OUTPUT POWER IN DECIBELS	13	14	0	14	10	DB AND POWER RATIOS
U1257	02-03 DO YOU USE LOGARITHMS TO COMPUTE ATTENUATION IN DECIBELS	13	15	0	14	10	
U1258	02-04 DUMMY TASK TO IDENTIFY INCUMBENTS WHO PERFORMED NO TASKS	3	3	0	5	0	



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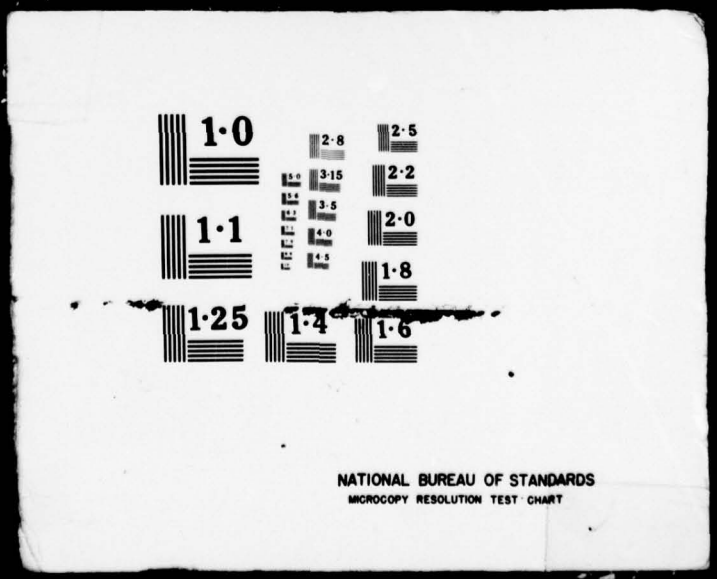

SUPPLEMENTARY

INFORMATION

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REPORT DOCUMENTATION PAGE

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1. REPORT NUMBER: AFPT 90-304-222	2. GOVT ACCESSION NO.: AD A045040 / 351
3. RECIPIENT'S CATALOG NUMBER	
4. TITLE (and Subtitle): Communications Electronics Systems Specialist AFSC 30455	5. TYPE OF REPORT & PERIOD COVERED: FINAL April 77 - June 77
	6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s): Thomas J. O'Connor, Harold T. Welch	8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Occupational Survey Brancy, USAF Occupational Measurement Center, Lackland AFB TX 78236	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: N/A
11. CONTROLLING OFFICE NAME AND ADDRESS: SAME AS ITEM 9	12. REPORT DATE: 2 September 1977
	13. NUMBER OF PAGES: 64
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)	15. SECURITY CLASS. (of this report): UNCLASSIFIED
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

A045040

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Electronic principles	Electronics
Basic electronics	Air Force training
Avionics	Teaching methods
Electronic equipment	Training
Electronic technicians	

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report summarizes the results of the administration of the Electronic Principles Inventory to airmen assigned as Communications Electronics Systems Specialist (AFSC 30455). The report gives a detailed listing of the technical tasks and knowledge needed to perform the jobs within the specialty or career ladder.

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